



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

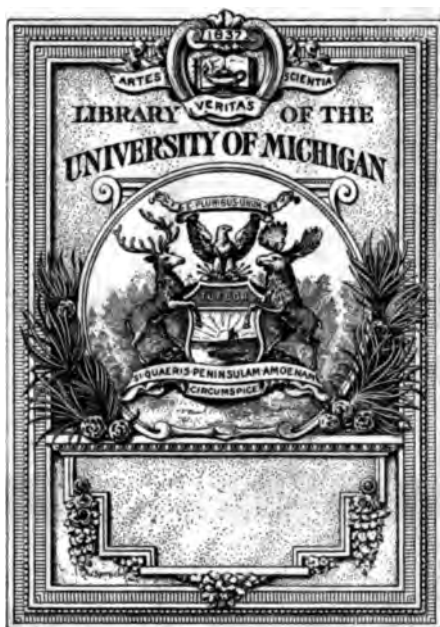
- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

B 1,058,737

T.F. Beal





U.S. Nautical Almanac

**THE
AMERICAN EPHEMERIS
AND
NAUTICAL ALMANAC**

✓
FOR THE YEAR

1918

4

**PUBLISHED BY THE NAUTICAL ALMANAC OFFICE, U. S.
NAVAL OBSERVATORY, BY DIRECTION OF THE SECRETARY
OF THE NAVY AND UNDER THE AUTHORITY OF CONGRESS.
SOLD BY THE SUPERINTENDENT OF DOCUMENTS,
GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C.
PRICE ONE DOLLAR**



**WASHINGTON
GOVERNMENT PRINTING OFFICE
1915**

U. S. NAVAL OBSERVATORY.

Captain J. A. HOOGEWERFF, *U. S. N., Superintendent.*

ASTRONOMICAL COUNCIL.

and J. A. HOOGEWERFF, <i>U. S. N.</i>	Prof. A. HALL, <i>U. S. N.</i>
and E. T. POLLOCK, <i>U. S. N.</i>	Assistant Astronomer G. A. HILL.
N. S. EICHELBERGER, <i>U. S. N.</i>	Assistant Astronomer J. C. HAMMOND.
F. B. LITTELL, <i>U. S. N.</i>	Assistant Astronomer H. R. MORGAN.

DEPARTMENT OF THE NAUTICAL ALMANAC.

Prof. W. S. EICHELBERGER, *U. S. N., Director.*

ASSISTANTS.

JAMES ROBERTSON.	GEORGE F. CRAWLEY.
WILLIAM T. CARRIGAN.	CLIFFORD S. LEWIS.
ARTHUR SNOW.	JOSEPH J. ARNAUD.
WALTER M. HAMILTON.	FRANK LANGELLOTTI.
ARTHUR NEWTON.	REUBEN WEINSTEIN.
PEREZ FISCH.	MORRIS LIFEROCK.

PIECEWORKERS.

<i>Elizabeth B. Davis.</i>	<i>George B. Merriman.</i>
<i>Janet McWilliam.</i>	<i>Frank E. Ross.</i>
<i>Hannah F. M. Hedrick.</i>	<i>Henry B. Hedrick.</i>
<i>Alfred Doolittle.</i>	<i>Thomas E. Trott.</i>
<i>Henry B. Evans.</i>	<i>Louis Lindsey.</i>

Isabel M. Lewis.

—Those whose names are printed in italics devote only a small portion of their time to work of the Nautical Office.

August, 1915.

PREFACE.

This volume of the *American Ephemeris and Nautical Almanac* was prepared under the immediate supervision of Professor W. S. EICHELBERGER, U. S. N., the Director. The character of the matter herein contained and its arrangement are the same as in the two preceding volumes.

This is the third volume to be issued under the international agreement resulting from the *Congrès International des Éphémérides Astronomiques* held at Paris in October, 1911.

The naval appropriation bill approved August 22, 1912, contained the following:

The Secretary of the Navy is hereby authorized to arrange for the exchange of data with such foreign almanac offices as he may from time to time deem desirable, with a view to reducing the amount of duplication of work in preparing the different national nautical and astronomical almanacs and increasing the total data which may be of use to navigators and astronomers available for publication in the *American Ephemeris and Nautical Almanac*: *Provided*, That any such arrangement shall be terminable on one year's notice: *Provided further*, That the work of the Nautical Almanac Office during the continuance of any such arrangement shall be conducted so that in case of emergency the entire portion of the work intended for the use of navigators may be computed by the force employed by that office, and without any foreign cooperation whatsoever: *Provided further*, That any employee of the Nautical Almanac Office who may be authorized in any annual appropriation bill and whose services in whole or in part can be spared from the duty of preparing for publication the annual volumes of the *American Ephemeris and Nautical Almanac* may be employed by said office in the duty of improving the tables of the planets, moon, and stars, to be used in preparing for publication the annual volumes of the office: *Provided further*, That section four hundred and thirty-five, Revised Statutes, is hereby repealed.

The Greenwich ephemerides of the Sun, Moon, Venus, Mars, Jupiter, Saturn, Uranus, and Neptune were furnished by the office of the *British Nautical Almanac*.

The Greenwich ephemeris of Mercury, the elements of Saturn's rings, the elongations of Saturn's satellites, and the apparent places for Greenwich transit of 518 ten-day stars were furnished by the office of the *Berliner Jahrbuch*.

The conjunctions, phenomena, and configurations of Jupiter's satellites I-IV and the apparent places for Greenwich transit of 38

circumpolar stars were furnished by the office of the *Connaissance des Temps*.

The apparent places for Greenwich transit of 121 ten-day stars were furnished by the office of the *Almanaque Nautico*.

The apparent places for Greenwich transit of 137 ten-day stars were furnished by the office of the *Annuario Astronomico di Torino*.

In accordance with the recommendations of the *Congrès International des Éphémérides Astronomiques*, most of the material furnished from abroad is based upon tables prepared in the American Nautical Almanac Office. In the Introduction are mentioned the various tables upon which the different ephemerides are based.

The following computations were made by the American Nautical Almanac Office:

In Part I, all the hourly and daily variations for the quantities furnished from abroad except in the case of the right ascension and declination of the Moon.

In Part II, the quantities used in computing the apparent places of the stars from their mean places; the mean place list; the interpolation of the apparent places of 814 stars from transit at Greenwich to transit at Washington; the apparent places of 11 stars; the interpolation of the ephemerides of the Sun, Moon, and planets from Greenwich noon to transit at Washington; the stellar magnitudes of the planets.

In Part III, the data relating to the eclipses of the Sun and Moon; the data relating to the occultations of stars and planets by the Moon; the ephemerides for physical observations of the Sun, Moon, Mars, and Jupiter; the elements of the illuminated disks of Mercury and Venus; the stellar magnitudes of the planets; the data concerning the satellites of Mars, Uranus, Neptune, the fifth, sixth, and seventh satellites of Jupiter, and the ninth satellite of Saturn; the diagrams of all the satellite orbits; the position angle and distance tables of the satellites of Saturn; the list of phenomena; the list of observatories with their geographical coordinates; and the tables for the determination of latitude and azimuth from observations of Polaris.

All computations made in the American Nautical Almanac Office and those received from the other offices were subjected to checks to insure absence of errors.

J A. HOOGEWERFF,
Captain, U. S. Navy,
Superintendent Naval Observatory.

U. S. NAVAL OBSERVATORY, August, 1915.

CONTENTS.

Errata	Page. vi
Introduction	vii
Anniversaries and Festivals	xiv
Chronological Eras and Cycles	xv
Astronomical Constants	xvi
Symbols and Abbreviations	xviii

PART I—EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Ephemeris of the Sun	2
Ephemeris of the Moon	26
Phases of the Moon	117
Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune	134

PART II—EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Bessel's Formulæ for Star-Reductions	200
Besselian and Independent Star-Numbers	202
Nutation, Terms of Short Period in the	215
Mean Places of 790 Standard Stars for 1918.0	217
Mean Places of 35 Circumpolar Stars for 1918.0	231
Apparent Places of 35 Circumpolar Stars	232
Apparent Places of 790 Standard Stars	316
Ephemeris of the Sun for Apparent Noon	514
Moon-Culminations	522
Transit-Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune	538

PART III—PHENOMENA.

Eclipses	558
Mean Places of Stars Occulted by the Moon	566
Elements for the Prediction of Occultations	571
Occultations Visible at Washington	609
Ephemeris for Physical Observations of the Sun	612
Moon, Mean Equator, Orbit, and Mean Longitude	613
Ephemeris for Physical Observations of the Moon	614
Disks of Mercury and Venus	622
Ephemeris for Physical Observations of Mars	624
Satellites of Mars	628
Ephemeris for Physical Observations of Jupiter	629
Satellites of Jupiter, Saturn, Uranus, and Neptune	633
Phenomena, Planetary Configurations	674
Positions of Observatories	676
Problems in Lunar Distances	686

TABLES.

Table I—For Finding the Latitude by an Observed Altitude of Polaris	687
Table Ia—Auxiliary Table of Corrections for Latitudes other than 45°	691
Table II—Sidereal into Mean Solar Time	692
Table III—Mean Solar into Sidereal Time	695
Table IV—Azimuth of Polaris at all Hour Angles	698
Table IVa—Correction for Declination	703
Table V—Azimuth of Polaris at Elongation	704
Table Va—For Reduction of Observations Near Elongation	709
Table VI—For Finding the Times of Upper and Lower Culmination of Polaris	710
Table VII—Apparent Place, Upper Culmination, and Elongations, of Polaris	711
On the Arrangement and Use of <i>The American Ephemeris and Nautical Almanac</i>	713
Index to Apparent Places of Stars	738
General Index	741

ERRATA.

The American Ephemeris, 1916.

19. η Cancr. Spectrum for B5p read K0
 2 For other errata, 1916. see: page viii of *The American Ephemeris, 1917.*

The American Ephemeris, 1917.

- 1 Formula for B , coefficient of $\cos 2 L$ for -0.552 read -0.551
 2 η Cancr. Spectrum for B5p read K0

INTRODUCTION.

The ephemeris of the Sun is constructed from NEWCOMB's *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is $8''.80$, *Paris Conference, May, 1896*.

The Sun's rectangular equatorial coordinates are computed from the longitudes and latitudes by the following formulæ:

$$\begin{aligned} X &= R \cos \lambda \\ Y &= R \sin \lambda \cos \omega - 19.3 R \beta \\ Z &= R \sin \lambda \sin \omega + 44.5 R \beta \end{aligned}$$

The reductions to mean equinox are computed by the formulæ—

$$\begin{aligned} \Delta X &= + Y \sec \omega \Delta \lambda \sin 1'' \\ \Delta Y &= -X \cos \omega \Delta \lambda \sin 1'' + Z \Delta \omega \sin 1'' + 9.1 \tau R \sin (\lambda + 6^\circ) \\ \Delta Z &= -X \sin \omega \Delta \lambda \sin 1'' - Y \Delta \omega \sin 1'' - 21.0 \tau R \sin (\lambda + 6^\circ) \end{aligned}$$

where the numerical coefficients are in units of the seventh place of decimals and

R —the Sun's distance from the Earth.

λ —the Sun's true longitude,

β —the Sun's true latitude, expressed in seconds of arc,

ω —the obliquity of the ecliptic,

$\Delta \lambda$ —the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year,

$\Delta \omega$ —the reduction of the mean to the apparent obliquity,

τ —the fraction of the year since the beginning of the Besselian fictitious year.

The longitude, latitude, and parallax of the Moon are derived from HANSEN's *Tables de la Lune* (London, 1857), the mean longitude being corrected as in previous years, beginning with the volume for the year 1883. The statement concerning these corrections which is contained in the volumes from 1883 to 1911, inclusive, is erroneous, in that they have not been computed strictly in accordance with the formula in NEWCOMB's *Researches on the Motion of the Moon*, part 1, page 268, *Washington Observations*, 1875, Appendix II. That formula is,

$$-1''.14 - 29''.17 T - 3''.86 T^2 - V_2 - 0''.09 \sin A - 15''.49 \cos A,$$

while the expression actually used is,

$$-1''.14 - 29''.17 T - 3''.76 T^2 - V_2 - 15''.49 \cos A.$$

In these formulæ T is the time in units of 100 years reckoned from 1800.

The ephemerides of Mercury, Venus, and Mars are derived from NEWCOMB's tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VI, parts 2, 3, and 4.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by GEORGE W. HILL, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 1 and 2.

The ephemerides of Uranus and Neptune are derived from NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 3 and 4.

The nutation used in computing the ephemerides of the Sun, Moon, and planets has been taken from Tables XXXII and XXXIII of NEWCOMB'S *Tables of the Sun*, *Astronomical Papers of the American Ephemeris*, Vol. VI, part 1. The formulæ from which this nutation is computed are as follows, the time interval T being expressed in units of 100 years, reckoned from 1900. See *Tables of the Sun*, page 26.

$$\begin{array}{ll}
 \delta\phi = -(17''.234 + 0''.017 T) \sin \Omega & \delta s = +9''.214 \cos \Omega \\
 + 0''.209 \sin 2 \Omega & -0''.090 \cos 2 \Omega \\
 - 1''.257 \sin 2 L & +0''.546 \cos 2 L \\
 - 0''.049 \sin (3 L + 78^\circ.7) & +0''.021 \cos (3 L + 78^\circ.7) \\
 + 0''.110 \sin (L + 75^\circ.3) & -0''.009 \cos (L - 78^\circ.7)
 \end{array}$$

The formulæ for the nutation used in computing the Besselian and Independent Star Numbers are as follows:

Terms of Long Period.	Terms of Short Period.
$\delta\phi = -(17''.234 + 0''.017 T) \sin \Omega$	$-0''.204 \sin 2 \zeta$
$+ 0''.209 \sin 2 \Omega$	$+0''.011 \sin (\zeta + \Gamma')$
$- 1''.272 \sin 2 L$	$+0''.068 \sin (\zeta - \Gamma')$
$+ 0''.126 \sin (L - \Gamma)$	$-0''.034 \sin (2 \zeta - \Omega)$
$- 0''.050 \sin (3 L - \Gamma)$	$-0''.026 \sin (3 \zeta - \Gamma')$
$+ 0''.021 \sin (L + \Gamma)$	$+0''.015 \sin (\zeta - 2 L + \Gamma')$
$+ 0''.012 \sin (2 L - \Omega)$	$+0''.006 \sin 2 (\zeta - L)$
$\delta s = + (9''.210 + 0''.0009 T) \cos \Omega$	$+0''.068 \cos 2 \zeta$
$- 0''.090 \cos 2 \Omega$	$+0''.018 \cos (2 \zeta - \Omega)$
$+ 0''.551 \cos 2 L$	$+0''.011 \cos (3 \zeta - \Gamma')$
$+ 0''.022 \cos (3 L - \Gamma)$	$-0''.005 \cos (\zeta + \Gamma')$
$- 0''.009 \cos (L + \Gamma)$	
$- 0''.007 \cos (2 L - \Omega)$	

The meaning of the symbols used and the manner in which these latter formulæ have been employed in computing the ephemerides of the stars are explained on pages 200 and 201. The slight discrepancy between the terms in 2 L in these two sets of formulæ is due to the correction of an error in the first set. See *Bulletin Astronomique*, 1898, Vol. XV, page 244.

The list of 825 stars contained in Part II has been selected from NEWCOMB'S *Catalogue of Fundamental Stars*, *Astronomical Papers of the American Ephemeris*, Vol. VIII, part 2.

In general, the names of the stars are the same as in NEWCOMB'S Suggested List of Fundamental Stars, except that the FLAMSTEED number has been omitted in all cases where Greek or italic letters are available. In some cases the constellation and number of the uranometries of HEIS or GOULD have been used. In all such cases, H¹ or the letter G precedes the constellation name, as, for example, 5 H¹. Cassiopeiæ and 38 G. Horologii.

The magnitudes of the stars have, with a few exceptions, been taken from *Annals of the Harvard College Observatory*, Vol. L, 1908.

The spectral classification has been furnished by the Harvard College Observatory. The notation is that of *Annals of Harvard College Observatory*, Vol. LVI.

The mean places, annual variations, and annual proper motions of the stars have been taken from NEWCOMB'S Catalogue, except that those of ϵ Hydri, 38 G. Horologii, and π Centauri have been taken from *Veröffentlichungen des Königlich Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33.

The values of $\Delta\alpha$ and $\Delta\delta$ which are given for the companions to the stars γ Andromedæ, α^1 Crucis, ζ^1 Ursæ Majoris and 61 Cygni, have been taken from BOSS'S *Preliminary General Catalogue*, and those for α^2 Geminorum from DOBERCK'S elements given in the *Astronomische Nachrichten*, 1904, vol. 166, page 145.

The formulæ for the computation of the Besselian and Independent Star Numbers are given on page 200, the coefficients being those given by NEWCOMB in *Bulletin Astronomique*, 1898, Vol. XV, page 241.

The terms of short period of the nutation, depending on the Moon's mean longitude, have been computed from the formulæ for these terms given above.

The method by which the right ascensions and declinations of the stars interpolated from the 10-day ephemerides are corrected for the effect of these short-period terms is given on page 201.

According to the formulæ on pages 200 and 201 the star constants $a, b, c, d, a', b', c', d'$ are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second-order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

To $\alpha - \alpha_0$,	To $\delta - \delta_0$,
$\begin{aligned} &+0.000\ 003\ r^2 \sin \alpha \left. \vphantom{\begin{matrix} +0.000\ 003 \\ -0.000\ 149 \\ -0.000\ 0650 \\ +0.000\ 0103 \\ -0.000\ 0107 \\ +0.000\ 0620 \\ -0.000\ 0622 \end{matrix}} \right\} \tan \delta \\ &-0.000\ 149\ r^2 \cos \alpha \left. \vphantom{\begin{matrix} -0.000\ 149 \\ -0.000\ 0650 \\ +0.000\ 0103 \\ -0.000\ 0107 \end{matrix}} \right\} \tan^2 \delta \\ &-0.000\ 0650\ r^2 \sin 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 0650 \\ +0.000\ 0103 \\ -0.000\ 0107 \\ +0.000\ 0620 \end{matrix}} \right\} \tan^2 \delta \\ &+0.000\ 0103 \sin 2\ \odot \cos 2\alpha \left. \vphantom{\begin{matrix} +0.000\ 0103 \\ -0.000\ 0107 \\ +0.000\ 0620 \\ -0.000\ 0622 \end{matrix}} \right\} \tan^2 \delta \\ &-0.000\ 0107 \cos 2\ \odot \sin 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 0107 \\ +0.000\ 0620 \\ -0.000\ 0622 \end{matrix}} \right\} \tan^2 \delta \\ &+0.000\ 0620 \sin 2\ \odot \cos 2\alpha \left. \vphantom{\begin{matrix} +0.000\ 0620 \\ -0.000\ 0622 \end{matrix}} \right\} \sec^2 \delta \\ &-0.000\ 0622 \cos 2\ \odot \sin 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 0622 \end{matrix}} \right\} \sec^2 \delta \\ &+0.000\ 0513 \sin (\odot + \odot_0) \cos 2\alpha \left. \vphantom{\begin{matrix} +0.000\ 0513 \\ -0.000\ 0507 \\ +0.000\ 0097 \end{matrix}} \right\} \tan \delta \sec \delta \\ &-0.000\ 0507 \cos (\odot + \odot_0) \sin 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 0507 \\ +0.000\ 0097 \end{matrix}} \right\} \tan \delta \sec \delta \\ &+0.000\ 0097 \sin (\odot - \odot_0) \cos 2\alpha \left. \vphantom{\begin{matrix} +0.000\ 0097 \\ -0.000\ 0053 \end{matrix}} \right\} \tan \delta \sec \delta \\ &-0.000\ 0053 \cos (\odot - \odot_0) \sin 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 0053 \end{matrix}} \right\} \tan \delta \sec \delta \end{aligned}$	$\begin{aligned} &+0.000\ 975\ r^2 \sin^2 \alpha \left. \vphantom{\begin{matrix} +0.000\ 975 \\ -0.000\ 023 \\ -0.000\ 080 \\ -0.000\ 077 \end{matrix}} \right\} \tan \delta \\ &-0.000\ 023 \cos 2\ \odot \left. \vphantom{\begin{matrix} -0.000\ 023 \\ -0.000\ 080 \\ -0.000\ 077 \end{matrix}} \right\} \tan \delta \\ &-0.000\ 080 \cos 2\ \odot \cos 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 080 \\ -0.000\ 077 \end{matrix}} \right\} \tan \delta \\ &-0.000\ 077 \sin 2\ \odot \sin 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 077 \\ +0.000\ 040 \end{matrix}} \right\} \tan \delta \\ &+0.000\ 040 \cos 2\ \odot \left. \vphantom{\begin{matrix} +0.000\ 040 \\ -0.000\ 467 \end{matrix}} \right\} \tan \delta \\ &-0.000\ 467 \cos 2\ \odot \cos 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 467 \\ -0.000\ 465 \end{matrix}} \right\} \tan \delta \\ &-0.000\ 465 \sin 2\ \odot \sin 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 465 \end{matrix}} \right\} \tan \delta \\ &-0.000\ 039 \cos (\odot + \odot_0) \left. \vphantom{\begin{matrix} -0.000\ 039 \\ -0.000\ 380 \end{matrix}} \right\} \sin \delta \tan \delta \\ &-0.000\ 380 \cos (\odot + \odot_0) \cos 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 380 \\ -0.000\ 385 \end{matrix}} \right\} \sin \delta \tan \delta \\ &-0.000\ 385 \sin (\odot + \odot_0) \sin 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 385 \\ -0.000\ 380 \end{matrix}} \right\} \sin \delta \tan \delta \\ &-0.000\ 380 \cos (\odot - \odot_0) \left. \vphantom{\begin{matrix} -0.000\ 380 \\ -0.000\ 040 \end{matrix}} \right\} \sin \delta \tan \delta \\ &-0.000\ 040 \cos (\odot - \odot_0) \cos 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 040 \\ -0.000\ 072 \end{matrix}} \right\} \sin \delta \tan \delta \\ &-0.000\ 072 \sin (\odot - \odot_0) \sin 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 072 \end{matrix}} \right\} \sin \delta \tan \delta \end{aligned}$

These terms are negligible for stars whose declination is numerically less than 80° , but in computing the apparent places given in the American Ephemeris they have been applied whenever sensible.

The *apparent* places of seven stars have been corrected for the effect of annual parallax. These stars, with the adopted values of the annual parallax, are—

r Ceti	0.31	α Centauri	0.75
ϵ Eridani	0.32	α Aquilæ (Altair)	0.23
α Canis Majoris (Sirius) . .	0.38	61 Cygni	0.30
α Canis Minoris (Procyon) .	0.33		

The *apparent* places of α Canis Majoris (Sirius), α Canis Minoris (Procyon), and α^2 Centauri have been corrected for the effect of orbital motion. AUWERS's elements were used for Sirius and Procyon, and SEE's elements for α^2 Centauri. The values of these corrections are given on pages 98 and 99 of *Veroeffentlichungen des Koeniglichen Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33, but those for Sirius and Procyon need an additional correction to refer them to the center of the orbit before they are applicable to the mean places taken from NEWCOMB's Fundamental Catalogue. These additional corrections for Sirius and Procyon were omitted in the *Star List of the American Ephemeris* [Supplement to the *American Ephemeris and Nautical Almanac*] for 1910 and 1911, and in the *American Ephemeris and Nautical Almanac* for 1912 and 1913. The values of the corrections for the three stars are—

	Sirius.		Procyon.		α^2 Centauri.	
	1918.0	1919.0	1918.0	1919.0	1918.0	1919.0
$\Delta\alpha$	-0°.143	-0°.143	-0°.061	-0°.057	+0°.634	+0°.620
$\Delta\delta$	-0''.72	-0''.84	+0''.18	+0''.31	+5''.70	+5''.41

These corrections have not been applied to the mean places as published in this volume.

The stars occulted by the Moon have been selected from the *Catalogue of Zodiacal Stars* contained in Vol. VIII, part 3, *Astronomical Papers of the American Ephemeris*, and the mean places have been derived from the same catalogue.

In Part III the elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with BESSEL's method, the special forms employed being a modification of those developed in CHAUVENET's *Spherical and Practical Astronomy*.

In the computation of the elements of eclipses, the following corrections to the longitude, latitude, and parallax of the Moon, deduced by NEWCOMB from recent observations of occultations of stars by the Moon, *Astronomical Papers of the American Ephemeris*, Vol. IX, part 1, have been applied. These corrections have been assumed in each case to be constant during the eclipse.

G. M. T.	δl	δb	$\delta \pi$
1918	"	"	"
June 8 ^d 10 ^h	+6.2	+1.2	+0.47
June 23 23	+6.7	-0.1	+0.45
Dec. 3 3	+6.2	-0.3	+0.42

The elongations of the satellites of Mars are derived from elements given by H. STRUVE in *Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften*, 1911, page 1073.

The conjunctions and phenomena of Jupiter's four brighter satellites are derived from SAMPSON's tables. The configurations are derived from a continuation of DAMOISEAU's tables by M. POTTIER.

The elongations of the Vth satellite of Jupiter are derived from unpublished elements deduced from the observations of BAERNARD.

The differential coordinates of Jupiter's VIth and VIIth satellites are derived from elements and tables given in *Lick Observatory Bulletin*, 1906, Vol. IV, No. 112, and in *Astronomische Nachrichten*, 1907, Vol. 174, page 359, respectively.

The positions of the rings and the elongations and conjunctions of the satellites of Saturn are derived from elements given by H. STRUVE in *Observations de Poulkova*, Supplement 1, St. Petersburg, 1888; *Publications de Poulkovo*, Second Series, Vol. XI, St. Petersburg, 1898; with corrections communicated by H. STRUVE to the *Berliner Jahrbuch*. The differential coordinates of Phœbe are derived from elements and tables given in *Annals of Harvard College Observatory*, 1905, Vol. LIII, No. VI.

The apparent outer dimensions (a and b) of the rings of Saturn are also according to STRUVE; the relative dimensions of the rings are computed from BESSEL'S data, except those for the dusky ring, which are based on the observations of various astronomers.

The elongations of Ariel and Umbriel, the inner satellites of Uranus, are derived from the data of NEWCOMB'S *Uranian and Neptunian Systems*, Washington Observations, 1873, Appendix I. The elongations of Titania and Oberon, the outer satellites of Uranus, are derived from elements given by H. STRUVE in *Abhandlungen der K. Preussischen Akademie der Wissenschaften*, 1912.

The elongations of the satellite of Neptune are derived from elements given by A. HALL in the *Astronomical Journal*, 1898, Vol. XIX, page 65.

The adopted apparent semidiameter of the Sun at the Earth's mean distance is $16' 1''.50$, while in the computation of eclipses the value given by AUWERS in the *Astronomische Nachrichten*, 1891, Vol. 128, page 367, is employed, viz., $15' 59''.63$.

In the computation of the ephemeris for physical observations of the Sun the following elements by CARRINGTON have been used:

Inclination of the Sun's equator to the ecliptic	$7^{\circ} 15'$
Longitude of the ascending node of the Sun's equator on the ecliptic	$73^{\circ} 40' + 50''.25 (t-1850)$
Sidereal period of rotation (mean solar days)	$25^d.38$

The apparent semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax, π , by the formula,

$$S = 0.272\ 506\ \pi + 1''.50$$

where the constant 0.272 506 is based on data from occultations given by J. PETERS in the *Astronomische Nachrichten*, 1895, Vol. 138, page 147; and the constant $1''.50$ is added to cover the average effect of irradiation.

The value of the Moon's semidiameter employed in the computation of eclipses is computed from the formula,

$$\sin S = 0.272\ 274\ \sin \pi$$

In the computation of the ephemeris for physical observations of the Moon, the following notation and formulæ have been used, the value of I and the formulæ for physical libration being those given by F. HARN in *Abhandlungen der K. Sächsischen Gesell. der Wissenschaften*, Vols. 29 and 30, 1904, 1907:

I —the inclination of the Moon's mean equator to the ecliptic ($-1^{\circ} 32'.1$),

Q —the longitude of the ascending node of the Moon's orbit, or the longitude of the descending node of the Moon's mean equator,

C —the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east,

$\lambda, \beta, \alpha, \delta$ —the geocentric longitude, latitude, right ascension, and declination of the Moon

i —the inclination of the Moon's mean equator to the Earth's true equator,

Δ —the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic,

Ω' —the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator,

ζ —the Moon's mean longitude, referred to the mean equinox,

g' —the Earth's mean anomaly,

g —the Moon's mean anomaly,

ω —the angular distance of the perigee of the Moon's orbit from its ascending node on the ecliptic,

b, l —the optical librations in latitude and longitude, respectively,

$\delta b, \delta l$ —the physical librations in latitude and longitude, respectively,

$b + \delta b$ —the Moon's geocentric libration in latitude—the Earth's selenographic latitude,

$l + \delta l$ —the Moon's geocentric libration in longitude—the Earth's selenographic longitude,

δC —the physical libration of C ,

$$\mu = -0'.617 \sin 2 (\Omega - \lambda),$$

$$A = \sin I \cos (\Omega - \lambda),$$

$$\tan B = \tan I \sin (\Omega - \lambda),$$

$$\lambda' = \lambda + \mu + \Delta b,$$

$$b = B - \beta,$$

$$l = \lambda' - \zeta,$$

$$\sin C' = \sin i \frac{\cos (\lambda' + \Delta - \Omega)}{\cos \delta} - \sin i \frac{\cos (\alpha - \Omega')}{\cos b},$$

$$\delta b = +108'' \sin (\omega + l) + 37'' \sin (\omega - l) - 11'' \sin (g + \omega - l),$$

$$\delta l = +12'' \sin g - 59'' \sin g' - 18'' \sin 2\omega,$$

$$- [108'' \cos (\omega + l) - 37'' \cos (\omega - l) + 11'' \cos (g + \omega - l)] \tan b,$$

$$\delta C = - [108'' \cos (\omega + l) - 37'' \cos (\omega - l) + 11'' \cos (g + \omega - l)] \sec b,$$

$$C = C' + \delta C.$$

The Sun's selenographic latitude and longitude have been computed from formulæ the same as those given above except that the heliocentric coordinates of the Moon have been substituted for the geocentric coordinates.

The following elements have been used in computing the ephemerides for physical observations of the planets Mars and Jupiter:

Position of north pole of Mars	$\left\{ \begin{array}{l} \alpha = 21^h 10^m 0^s + 1^s.565(t-1905) \\ \delta = 54^\circ 30' 0'' + 12''.60(t-1905) \end{array} \right.$
Position of north pole of Jupiter	$\left\{ \begin{array}{l} \alpha = 17^h 52^m 0^s.84 + 0^s.247(t-1910) \\ \delta = 64^\circ 33' 34''.6 - 0''.60(t-1910) \end{array} \right.$
Rotation period of Mars	$24^h 37^m 22^s.65$
Rotation period of Jupiter $\left\{ \begin{array}{l} \text{System I.} \\ \text{System II.} \end{array} \right.$	$\left\{ \begin{array}{l} 9^h 50^m 30^s.004 \\ 9^h 55^m 40^s.632 \end{array} \right.$
Longitude of Central Meridian of Mars, May 15, 1897, Greenwich Mean Noon	$52^\circ.01$
Longitude of Central Meridian of Jupiter (System I.), July 14, 1897, Greenwich Mean Noon	$47^\circ.31$
Longitude of Central Meridian of Jupiter (System II.), July 14, 1897, Greenwich Mean Noon	$96^\circ.58$

The position of the north pole of Mars is as given by LOWELL and CROMMELIN (see *Monthly Notices R. A. S.*, 1905, Vol. 66, page 56), while that of the north pole of Jupiter has been deduced from the position given by DAMOISEAU for 1750 (see *Tables Écliptiques des Satellites de Jupiter*, page (1)). The rotation periods of Mars and of Jupiter and the longitudes of the central meridians are according to MARTH (see *Monthly Notices R. A. S.*, 1896, Vol. 56, pages 395-403 and 517-524). The longitude of the Great Red Spot and the time of its transit across the Central Meridian given in the volumes for 1913 and 1914

have been replaced by those of System II. of MARTH. This change has been made in view of the following facts: The Paris Conference of October, 1911, assigned to the office of the American Ephemeris and Nautical Almanac the preparation of the ephemerides for the physical observations of the planets; a general desire exists that the use of System II. of MARTH should not be discontinued; and the position of the Great Red Spot during the opposition of 1912 was about 70° from the place predicted from the elements adopted in the *American Ephemeris and Nautical Almanac* for 1913.

The adopted semidiameters of the planets, with the authority for each, are given on page xvii. Their stellar magnitudes have been computed from formulæ given by G. MUELLER in *Publicationen des Astrophysikalischen Observatoriums zu Potsdam*, 1893, Vol. 8, page 366.

In the list of observatories the authority for the various positions is given in each case. The latitudes given are in most cases astronomical. In some instances they have been determined by geodetic triangulation from other points. The reductions from geographic to geocentric latitude, $\varphi' - \varphi$, and the distance from the center of the earth, ρ , are computed from the formulæ on page xvi, using the flattening $\frac{1}{297}$ obtained by JOHN F. HAYFORD in *Supplementary Investigation in 1909 of the Figure of the Earth and Isostasy*, U. S. Coast and Geodetic Survey, 1910, and adopted by the Paris Conference, October, 1911.

ANNIVERSARIES AND FESTIVALS, 1918.

New Year's Day	Tuesday,	Jan. 1.
Epiphany	Sunday,	Jan. 6.
Septuagesima Sunday	Sunday,	Jan. 27.
Quinquagesima (Shrove Sunday)	Sunday,	Feb. 10.
Lincoln's Birthday	Tuesday,	Feb. 12.
Ash Wednesday	Wednesday,	Feb. 13.
Washington's Birthday	Friday,	Feb. 22.
Palm Sunday	Sunday,	Mar. 24.
First Day of Passover	Thursday,	Mar. 28.
Good Friday	Friday,	Mar. 29.
Easter Sunday	Sunday,	Mar. 31.
Rogation Sunday	Sunday,	May 5.
Ascension Day (Holy Thursday)	Thursday,	May 9.
Hebrew Pentecost (Shebuoth)	Friday,	May 17.
Pentecost (Whit Sunday)	Sunday,	May 19.
Trinity Sunday	Sunday,	May 26.
Memorial Day	Thursday,	May 30.
Corpus Christi	Thursday,	May 30.
Independence Day	Thursday,	July 4.
Labor Day	Monday,	Sept. 2.
Hebrew New Year (Rosh Hashanah)	Saturday,	Sept. 7.
Day of Atonement (Yom Kippur)	Monday,	Sept. 16.
First Day of Tabernacle (Sucoth)	Saturday,	Sept. 21.
Columbus Day	Saturday,	Oct. 12.
General Election Day (except in certain States)	Tuesday,	Nov. 5.
Thanksgiving Day	Thursday,	Nov. 28.
First Sunday in Advent	Sunday,	Dec. 1.
Christmas Day	Wednesday,	Dec. 25.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

The year 1918 of the Christian era comprises the latter part of the 142d and the beginning of the 143d year of the independence of the United States of America, and corresponds to the year 6631 of the Julian period.

Of the peoples using the Christian era some employ the Gregorian calendar and some the Julian. January 1, 1918, Julian calendar, corresponds to January 14, 1918, Gregorian calendar.

The year 7427 of the Byzantine era begins on September 1, 1918, Julian calendar.

The year 5679 of the Jewish era begins at sunset on September 6, 1918, Gregorian calendar.

The year 2671 since the foundation of Rome, according to VARRO, begins on January 1, 1918, Julian calendar.

The year 2667 of the era of NABONASSAR begins on May 1, 1918, Julian calendar.

The year 2578 of the Japanese era, being the 7th year of the period Taisho, begins on January 1, 1918, Gregorian calendar.

The year 2230 of the Grecian era, or the era of the SELEUCIDÆ, begins in the present day usage of the Syrians on September 1, 1918, or on October 1, 1918, Julian calendar, according to different sects; but in the ancient usage of Damascus and Arabia Petræa the year began with the vernal equinox.

The year 1635 of the era of DIOCLETIAN begins on August 29, 1918, Julian calendar.

The year 1337 of the Mohammedan era, or the era of the Hegira, begins at sunset on October 6, 1918, Gregorian calendar.

2 421 595 is the Julian day number of January 1, 1918, Gregorian calendar.

CHRONOLOGICAL CYCLES.

Dominical Letter	F	Solar Cycle	23
Epact	17	Roman Indiction	1
Lunar Cycle or Golden Number	19	Julian Period	6631

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉ The Sun.	♂ Mars.
☾ The Moon.	♃ Jupiter.
☿ Mercury.	♄ Saturn.
♀ Venus.	♅ Uranus.
♁ The Earth.	♆ Neptune.

SIGNS OF THE ZODIAC.

ing { 1. ♈ Aries.	Autumn { 7. ♎ Libra.
ns. { 2. ♉ Taurus.	Signs. { 8. ♏ Scorpius.
	9. ♐ Sagittarius.
mer { 4. ♋ Cancer.	Winter { 10. ♑ Capricornus.
ns. { 5. ♌ Leo.	Signs. { 11. ♒ Aquarius.
	12. ♓ Pisces.
6. ♍ Virgo.	

ASPECTS.

- ♌ Conjunction, or having the same Longitude or Right Ascension.
- ☐ Quadrature, or differing $\pm 90^\circ$ in Longitude or Right Ascension.
- ♌ Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

♊ Ascending Node.	° Degrees.
♋ Descending Node.	' Minutes of Arc.
N. North.	" Seconds of Arc.
S. South.	h Hours.
E. East.	m Minutes of Time.
W. West.	s Seconds of Time.

PART I.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Jan. 1	Tu	18 44 44.66	11.042	-23 3 5.4	+11.80	16 17.88	8.95	- 3 26.25	-1.185	18 41 18.41
2	We	18 49 9.52	11.029	22 58 8.4	12.95	16 17.88	8.95	3 54.55	1.172	18 45 14.97
3	Th	18 53 34.06	11.015	22 52 43.9	14.09	16 17.87	8.95	4 22.53	1.159	18 49 11.53
4	Fr	18 57 58.25	11.000	22 46 52.1	15.22	16 17.86	8.95	4 50.16	1.143	18 53 8.09
5	Sa	19 2 22.05	10.983	22 40 33.1	16.35	16 17.84	8.95	5 17.41	1.127	18 57 4.65
6	Su	19 6 45.45	10.966	-22 33 47.1	+17.47	16 17.82	8.95	- 5 44.25	-1.109	19 1 1.20
7	Mo	19 11 8.42	10.947	22 26 34.3	18.59	16 17.79	8.95	6 10.65	1.090	19 4 57.76
8	Tu	19 15 30.91	10.927	22 18 54.9	19.69	16 17.76	8.95	6 36.59	1.071	19 8 54.32
9	We	19 19 52.92	10.906	22 10 49.1	20.79	16 17.72	8.95	7 2.04	1.050	19 12 50.88
10	Th	19 24 14.40	10.884	22 2 17.2	21.87	16 17.68	8.95	7 26.97	1.027	19 16 47.44
11	Fr	19 28 35.34	10.860	-21 53 19.4	+22.94	16 17.63	8.95	- 7 51.35	-1.004	19 20 43.99
12	Sa	19 32 55.70	10.836	21 43 56.0	24.00	16 17.58	8.95	8 15.15	0.979	19 24 40.55
13	Su	19 37 15.46	10.810	21 34 7.3	25.05	16 17.53	8.95	8 38.35	0.954	19 28 37.11
14	Mo	19 41 34.59	10.783	21 23 53.6	26.09	16 17.48	8.95	9 0.92	0.927	19 32 33.67
15	Tu	19 45 53.06	10.755	21 13 15.2	27.11	16 17.42	8.95	9 22.84	0.898	19 36 30.22
16	We	19 50 10.85	10.727	-21 2 12.4	+28.12	16 17.36	8.95	- 9 44.07	-0.870	19 40 26.78
17	Th	19 54 27.94	10.697	20 50 45.5	29.11	16 17.29	8.94	10 4.60	0.840	19 44 23.34
18	Fr	19 58 44.31	10.667	20 38 55.0	30.09	16 17.22	8.94	10 24.41	0.810	19 48 19.90
19	Sa	20 2 59.94	10.636	20 26 41.1	31.06	16 17.14	8.94	10 43.49	0.779	19 52 16.45
20	Su	20 7 14.82	10.604	20 14 4.1	32.01	16 17.06	8.94	11 1.81	0.747	19 56 13.01
21	Mo	20 11 28.93	10.572	-20 1 4.4	+32.95	16 16.98	8.94	-11 19.36	-0.715	20 0 9.57
22	Tu	20 15 42.26	10.539	19 47 42.4	33.87	16 16.89	8.94	11 36.14	0.683	20 4 6.12
23	We	20 19 54.81	10.506	19 33 58.4	34.77	16 16.79	8.94	11 52.13	0.650	20 8 2.68
24	Th	20 24 6.57	10.473	19 19 52.7	35.68	16 16.69	8.94	12 7.33	0.617	20 11 59.24
25	Fr	20 28 17.53	10.440	19 5 25.7	36.56	16 16.58	8.94	12 21.73	0.583	20 15 55.79
26	Sa	20 32 27.68	10.406	-18 50 37.8	+37.43	16 16.47	8.94	-12 35.33	-0.550	20 19 52.35
27	Su	20 36 37.03	10.373	18 35 29.2	38.28	16 16.35	8.94	12 48.13	0.516	20 23 48.91
28	Mo	20 40 45.58	10.339	18 20 0.5	39.11	16 16.22	8.93	13 0.12	0.483	20 27 45.46
29	Tu	20 44 53.32	10.305	18 4 11.9	39.93	16 16.09	8.93	13 11.30	0.449	20 31 42.02
30	We	20 49 0.24	10.272	17 48 3.8	40.74	16 15.95	8.93	13 21.67	0.415	20 35 38.58
31	Th	20 53 6.36	10.238	-17 31 36.6	+41.52	16 15.81	8.93	-13 31.23	-0.381	20 39 35.13
Feb. 1	Fr	20 57 11.67	10.205	17 14 50.8	42.29	16 15.67	8.93	13 39.98	0.348	20 43 31.69
2	Sa	21 1 16.18	10.171	16 57 46.6	43.05	16 15.51	8.93	13 47.93	0.315	20 47 28.24
3	Su	21 5 19.88	10.137	16 40 24.5	43.79	16 15.36	8.93	13 55.08	0.281	20 51 24.80
4	Mo	21 9 22.78	10.104	16 22 44.9	44.51	16 15.20	8.93	14 1.42	0.248	20 55 21.36
5	Tu	21 13 24.88	10.071	-16 4 48.1	+45.21	16 15.02	8.92	-14 6.97	-0.215	20 59 17.91
6	We	21 17 26.19	10.038	15 46 34.7	45.90	16 14.85	8.92	14 11.72	0.181	21 3 14.47
7	Th	21 21 26.70	10.005	15 28 5.0	46.57	16 14.68	8.92	14 15.68	0.149	21 7 11.02
8	Fr	21 25 26.43	9.972	15 9 19.4	47.22	16 14.51	8.92	14 18.85	0.116	21 11 7.58
9	Sa	21 29 25.38	9.940	14 50 18.4	47.85	16 14.33	8.92	14 21.24	0.083	21 15 4.13
10	Su	21 33 23.54	9.907	-14 31 2.4	+48.47	16 14.15	8.92	-14 22.85	-0.051	21 19 0.69
11	Mo	21 37 20.93	9.875	14 11 31.9	49.06	16 13.97	8.91	14 23.68	-0.019	21 22 57.24
12	Tu	21 41 17.54	9.843	13 51 47.3	49.64	16 13.78	8.91	14 23.74	+0.014	21 26 53.80
13	We	21 45 13.38	9.811	13 31 49.0	50.20	16 13.59	8.91	14 23.03	0.046	21 30 50.35
14	Th	21 49 8.46	9.779	13 11 37.6	50.74	16 13.40	8.91	14 21.55	0.077	21 34 46.91
15	Fr	21 53 2.78	9.748	-12 51 13.4	+51.26	16 13.21	8.91	-14 19.32	+0.109	21 38 43.46
16	Sa	21 56 56.35	9.717	-12 30 36.9	+51.77	16 13.02	8.91	-14 16.33	+0.140	21 42 40.02

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	" 23° 26'	h m s
an. 1	1	280 17 18.8	152.86	-0.69	9.992 6651	-0.2	0.04	+17.67	20.81	59.55	5 17 49.38
2	2	281 18 27.6	152.87	0.75	9.992 6659	+0.9	0.18	17.72	20.81	59.55	5 13 53.46
3	3	282 19 36.7	152.88	0.78	9.992 6692	1.9	0.32	17.76	20.81	59.54	5 9 57.55
4	4	283 20 45.9	152.89	0.78	9.992 6749	2.9	0.46	17.80	20.81	59.54	5 6 1.64
5	5	284 21 55.4	152.90	0.76	9.992 6830	3.9	0.60	17.85	20.81	59.54	5 2 5.73
6	6	285 23 5.0	152.90	-0.71	9.992 6934	+4.8	0.73	+17.89	20.81	59.54	4 58 9.82
7	7	286 24 14.7	152.91	0.64	9.992 7060	5.7	0.87	17.93	20.81	59.54	4 54 13.90
8	8	287 25 24.5	152.91	0.54	9.992 7206	6.5	1.01	17.97	20.81	59.54	4 50 17.99
9	9	288 26 34.2	152.91	0.42	9.992 7371	7.2	1.15	18.01	20.81	59.55	4 46 22.08
10	10	289 27 44.0	152.90	0.28	9.992 7554	8.0	1.28	18.05	20.81	59.55	4 42 26.17
11	11	290 28 53.6	152.89	-0.14	9.992 7754	+8.7	1.42	+18.09	20.81	59.55	4 38 30.26
12	12	291 30 2.9	152.88	0.00	9.992 7970	9.8	1.56	18.13	20.81	59.55	4 34 34.34
13	13	292 31 12.0	152.87	+0.13	9.992 8202	10.0	1.70	18.16	20.81	59.56	4 30 38.43
14	14	293 32 20.5	152.84	0.25	9.992 8449	10.6	1.83	18.20	20.80	59.56	4 26 42.52
15	15	294 33 28.5	152.82	0.34	9.992 8712	11.3	1.97	18.23	20.80	59.57	4 22 46.61
16	16	295 34 35.8	152.79	+0.41	9.992 8992	+12.0	2.11	+18.27	20.80	59.57	4 18 50.70
17	17	296 35 42.3	152.75	0.45	9.992 9288	12.8	2.25	18.30	20.80	59.58	4 14 54.78
18	18	297 36 48.0	152.72	0.45	9.992 9604	13.6	2.38	18.33	20.80	59.59	4 10 58.87
19	19	298 37 52.7	152.68	0.41	9.992 9939	14.4	2.52	18.36	20.80	59.59	4 7 2.96
20	20	299 38 56.5	152.64	0.35	9.993 0296	15.3	2.66	18.38	20.80	59.60	4 3 7.05
21	21	300 39 59.4	152.60	+0.26	9.993 0675	+16.3	2.80	+18.41	20.79	59.60	3 59 11.14
22	22	301 41 1.3	152.56	0.15	9.993 1078	17.3	2.93	18.43	20.79	59.61	3 55 15.23
23	23	302 42 2.1	152.51	+0.03	9.993 1506	18.4	3.07	18.45	20.79	59.62	3 51 19.32
24	24	303 43 2.0	152.48	-0.10	9.993 1959	19.4	3.21	18.48	20.79	59.63	3 47 23.41
25	25	304 44 1.0	152.44	0.22	9.993 2438	20.5	3.35	18.50	20.79	59.64	3 43 27.50
26	26	305 44 59.0	152.40	-0.34	9.993 2943	+21.6	3.48	+18.51	20.78	59.65	3 39 31.59
27	27	306 45 56.1	152.36	0.45	9.993 3474	22.7	3.62	18.53	20.78	59.66	3 35 35.68
28	28	307 46 52.3	152.32	0.54	9.993 4031	23.7	3.76	18.55	20.78	59.66	3 31 39.77
29	29	308 47 47.6	152.29	0.60	9.993 4613	24.8	3.90	18.56	20.77	59.67	3 27 43.86
30	30	309 48 42.1	152.25	0.64	9.993 5219	25.8	4.03	18.57	20.77	59.68	3 23 47.95
31	31	310 49 35.7	152.21	-0.65	9.993 5850	+26.8	4.17	+18.58	20.77	59.69	3 19 52.04
32	32	311 50 28.4	152.18	0.63	9.993 6504	27.7	4.31	18.59	20.77	59.70	3 15 56.13
33	33	312 51 20.3	152.14	0.59	9.993 7180	28.6	4.45	18.60	20.76	59.71	3 12 0.22
34	34	313 52 11.3	152.11	0.53	9.993 7876	29.4	4.58	18.60	20.76	59.72	3 8 4.31
35	35	314 53 1.5	152.07	0.44	9.993 8593	30.3	4.72	18.60	20.76	59.73	3 4 8.40
36	36	315 53 50.8	152.03	-0.33	9.993 9328	+31.0	4.86	+18.61	20.75	59.74	3 0 12.49
37	37	316 54 39.1	151.99	0.20	9.994 0080	31.6	5.00	18.61	20.75	59.75	2 56 16.58
38	38	317 55 26.4	151.96	-0.07	9.994 0847	32.2	5.14	18.60	20.74	59.76	2 52 20.67
39	39	318 56 12.8	151.91	+0.06	9.994 1628	32.8	5.27	18.60	20.74	59.77	2 48 24.76
40	40	319 56 58.0	151.86	0.20	9.994 2422	33.3	5.41	18.60	20.74	59.78	2 44 28.85
41	41	320 57 42.1	151.81	+0.32	9.994 3227	+33.7	5.55	+18.59	20.73	59.79	2 40 32.94
42	42	321 58 24.9	151.75	0.42	9.994 4042	34.2	5.69	18.58	20.73	59.80	2 36 37.03
43	43	322 59 6.3	151.69	0.49	9.994 4868	34.6	5.82	18.57	20.73	59.81	2 32 41.12
44	44	323 59 46.2	151.63	0.53	9.994 5703	35.0	5.96	18.56	20.72	59.82	2 28 45.21
45	45	325 0 24.5	151.56	0.53	9.994 6548	35.4	6.10	18.55	20.72	59.83	2 24 49.30
46	46	326 1 1.1	151.49	+0.50	9.994 7404	+35.9	6.24	+18.54	20.71	59.84	2 20 53.39
47	47	327 1 36.0	151.41	+0.44	9.994 8272	+36.4	6.37	+18.52	20.71	59.85	2 16 57.49

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Feb. 16	Sa	21 56 56.35	9.717	-12 30 36.9	+51.77	16 13.02	8.91	-14 16.33	+0.140	21 42 40.02
17	Su	22 0 49.18	9.686	12 9 48.5	52.26	16 12.82	8.90	14 12.61	0.170	21 46 36.57
18	Mo	22 4 41.28	9.656	11 48 48.6	52.73	16 12.62	8.90	14 8.16	0.200	21 50 33.12
19	Tu	22 8 32.67	9.627	11 27 37.6	53.18	16 12.42	8.90	14 3.00	0.230	21 54 29.68
20	We	22 12 23.37	9.598	11 6 15.9	53.62	16 12.21	8.90	13 57.14	0.258	21 58 26.23
21	Th	22 16 13.38	9.570	-10 44 44.0	+54.04	16 12.00	8.90	-13 50.60	+0.286	22 2 22.79
22	Fr	22 20 2.73	9.543	10 23 2.1	54.44	16 11.78	8.89	13 43.39	0.314	22 6 19.34
23	Sa	22 23 51.43	9.516	10 1 10.8	54.83	16 11.56	8.89	13 35.54	0.340	22 10 15.89
24	Su	22 27 39.50	9.490	9 39 10.4	55.20	16 11.34	8.89	13 27.06	0.366	22 14 12.45
25	Mo	22 31 26.96	9.465	9 17 1.2	55.56	16 11.11	8.89	13 17.96	0.391	22 18 9.00
26	Tu	22 35 13.84	9.441	- 8 54 43.6	+55.90	16 10.88	8.89	-13 8.28	+0.415	22 22 5.55
27	We	22 39 0.14	9.418	8 32 18.1	56.22	16 10.65	8.88	12 58.04	0.438	22 26 2.11
28	Th	22 42 45.90	9.395	8 9 45.1	56.53	16 10.41	8.88	12 47.24	0.461	22 29 58.66
Mar. 1	Fr	22 46 31.12	9.374	7 47 4.8	56.82	16 10.16	8.88	12 35.91	0.483	22 33 55.21
2	Sa	22 50 15.84	9.353	7 24 17.7	57.10	16 9.92	8.88	12 24.07	0.508	22 37 51.77
3	Su	22 54 0.07	9.333	- 7 1 24.2	+57.36	16 9.67	8.87	-12 11.75	+0.523	22 41 48.32
4	Mo	22 57 43.83	9.314	6 38 24.6	57.60	16 9.42	8.87	11 58.96	0.542	22 45 44.87
5	Tu	23 1 27.15	9.296	6 15 19.3	57.83	16 9.16	8.87	11 45.72	0.560	22 49 41.43
6	We	23 5 10.04	9.279	5 52 8.8	58.04	16 8.91	8.87	11 32.06	0.578	22 53 37.98
7	Th	23 8 52.52	9.262	5 28 53.3	58.24	16 8.65	8.87	11 17.99	0.594	22 57 34.53
8	Fr	23 12 34.62	9.246	- 5 5 33.4	+58.42	16 8.39	8.86	-11 3.53	+0.610	23 1 31.09
9	Sa	23 16 16.34	9.231	4 42 9.4	58.58	16 8.13	8.86	10 48.70	0.625	23 5 27.64
10	Su	23 19 57.72	9.217	4 18 41.6	58.72	16 7.87	8.86	10 33.52	0.639	23 9 24.19
11	Mo	23 23 38.76	9.203	3 55 10.6	58.86	16 7.61	8.86	10 18.01	0.653	23 13 20.74
12	Tu	23 27 19.48	9.190	3 31 36.6	58.97	16 7.34	8.85	10 2.18	0.666	23 17 17.30
13	We	23 30 59.90	9.178	- 3 8 0.2	+59.06	16 7.08	8.85	- 9 46.05	+0.678	23 21 13.85
14	Th	23 34 40.03	9.166	2 44 21.8	59.14	16 6.82	8.85	9 29.63	0.690	23 25 10.40
15	Fr	23 38 19.88	9.155	2 20 41.6	59.20	16 6.56	8.85	9 12.93	0.701	23 29 6.96
16	Sa	23 41 59.48	9.145	1 57 0.2	59.24	16 6.29	8.84	8 55.97	0.711	23 33 3.51
17	Su	23 45 38.84	9.135	1 33 18.0	59.27	16 6.03	8.84	8 38.78	0.721	23 37 0.06
18	Mo	23 49 17.98	9.127	- 1 9 35.2	+59.29	16 5.77	8.84	- 8 21.37	+0.730	23 40 56.61
19	Tu	23 52 56.92	9.119	0 45 52.3	59.28	16 5.50	8.84	8 3.76	0.738	23 44 53.17
20	We	23 56 35.68	9.112	- 0 22 9.6	59.27	16 5.24	8.83	7 45.96	0.745	23 48 49.72
21	Th	0 0 14.28	9.105	+ 0 1 32.6	59.24	16 4.97	8.83	7 28.00	0.751	23 52 46.27
22	Fr	0 3 52.74	9.100	0 25 13.8	59.19	16 4.70	8.83	7 9.91	0.756	23 56 42.83
23	Sa	0 7 31.08	9.096	+ 0 48 53.7	+59.13	16 4.43	8.83	- 6 51.70	+0.761	0 0 39.38
24	Su	0 11 9.33	9.092	1 12 32.1	59.06	16 4.16	8.82	6 33.40	0.764	0 4 35.93
25	Mo	0 14 47.51	9.090	1 36 8.5	58.97	16 3.89	8.82	6 15.03	0.766	0 8 32.48
26	Tu	0 18 25.65	9.088	1 59 42.6	58.87	16 3.62	8.82	5 56.61	0.768	0 12 29.04
27	We	0 22 3.75	9.088	2 23 14.1	58.75	16 3.34	8.82	5 38.17	0.769	0 16 25.59
28	Th	0 25 41.86	9.088	+ 2 46 42.7	+58.62	16 3.07	8.81	- 5 19.72	+0.768	0 20 22.14
29	Fr	0 29 19.99	9.090	3 10 8.0	58.48	16 2.79	8.81	5 1.29	0.767	0 24 18.69
30	Sa	0 32 58.16	9.092	3 33 29.7	58.32	16 2.51	8.81	4 42.91	0.764	0 28 15.25
31	Su	0 36 36.40	9.095	3 56 47.5	58.15	16 2.23	8.81	4 24.60	0.761	0 32 11.80
Apr. 1	Mo	0 40 14.73	9.099	4 20 0.9	57.96	16 1.95	8.80	4 6.37	0.757	0 36 8.35
2	Tu	0 43 53.17	9.104	+ 4 43 9.7	+57.76	16 1.67	8.80	- 3 48.26	+0.752	0 40 4.91
3	We	0 47 31.74	9.110	+ 5 6 13.6	+57.55	16 1.39	8.80	- 3 30.28	+0.746	0 44 1.46

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.			Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliv-uity.	Mean Time of Sidereal Noon.
		"	"	"	"	"		"	"	"	"	23° 26'	h m s
Feb. 16	47	327	1	36.0	151.41	+0.44	9.994 8272	+36.4	6.37	+18.52	20.71	59.85	2 16 57.49
17	48	328	2	9.0	151.34	0.36	9.994 9153	37.0	6.51	18.50	20.71	59.86	2 13 1.58
18	49	329	2	40.2	151.26	0.25	9.995 0048	37.6	6.65	18.48	20.70	59.86	2 9 5.67
19	50	330	3	9.6	151.18	+0.12	9.995 0959	38.3	6.79	18.46	20.70	59.87	2 5 9.76
20	51	331	3	37.0	151.11	-0.01	9.995 1886	39.0	6.92	18.44	20.69	59.88	2 1 13.85
21	52	332	4	2.7	151.03	-0.14	9.995 2831	+39.7	7.06	+18.42	20.69	59.88	1 57 17.94
22	53	333	4	26.5	150.95	0.26	9.995 3793	40.4	7.20	18.40	20.68	59.89	1 53 22.04
23	54	334	4	48.4	150.88	0.36	9.995 4772	41.2	7.34	18.37	20.68	59.90	1 49 26.13
24	55	335	5	8.6	150.81	0.45	9.995 5770	42.0	7.47	18.34	20.67	59.90	1 45 30.22
25	56	336	5	27.1	150.73	0.53	9.995 6787	42.7	7.61	18.31	20.67	59.91	1 41 34.31
26	57	337	5	43.8	150.66	-0.58	9.995 7821	+43.4	7.75	+18.29	20.66	59.91	1 37 38.40
27	58	338	5	58.8	150.59	0.60	9.995 8872	44.2	7.89	18.26	20.66	59.92	1 33 42.50
28	59	339	6	12.1	150.52	0.59	9.995 9941	44.9	8.02	18.22	20.65	59.92	1 29 46.59
Mar. 1	60	340	6	23.7	150.45	0.56	9.996 1025	45.5	8.16	18.19	20.65	59.93	1 25 50.68
2	61	341	6	33.8	150.39	0.50	9.996 2125	46.1	8.30	18.16	20.64	59.93	1 21 54.78
3	62	342	6	42.2	150.32	-0.42	9.996 3240	+46.7	8.44	+18.12	20.64	59.93	1 17 58.87
4	63	343	6	49.1	150.25	0.32	9.996 4368	47.2	8.57	18.09	20.63	59.93	1 14 2.96
5	64	344	6	54.4	150.19	0.21	9.996 5508	47.7	8.71	18.05	20.63	59.93	1 10 7.05
6	65	345	6	58.1	150.12	-0.09	9.996 6658	48.1	8.85	18.01	20.62	59.93	1 6 11.15
7	66	346	7	0.2	150.06	+0.04	9.996 7817	48.4	8.98	17.97	20.62	59.93	1 2 15.24
8	67	347	7	0.8	149.99	+0.16	9.996 8983	+48.7	9.12	+17.93	20.61	59.93	0 58 19.33
9	68	348	6	59.7	149.92	0.27	9.997 0155	49.9	9.26	17.89	20.61	59.93	0 54 23.43
10	69	349	6	56.9	149.85	0.37	9.997 1330	49.0	9.40	17.85	20.60	59.93	0 50 27.52
11	70	350	6	52.4	149.77	0.44	9.997 2508	49.1	9.54	17.81	20.59	59.92	0 46 31.61
12	71	351	6	46.1	149.70	0.48	9.997 3686	49.1	9.68	17.77	20.59	59.92	0 42 35.70
13	72	352	6	37.9	149.61	+0.48	9.997 4865	+49.1	9.81	+17.73	20.58	59.91	0 38 39.80
14	73	353	6	27.6	149.53	0.45	9.997 6043	49.1	9.95	17.69	20.58	59.91	0 34 43.89
15	74	354	6	15.2	149.44	0.40	9.997 7222	49.1	10.09	17.64	20.57	59.91	0 30 47.98
16	75	355	6	0.7	149.35	0.32	9.997 8402	49.2	10.23	17.60	20.57	59.90	0 26 52.08
17	76	356	5	43.9	149.25	0.20	9.997 9584	49.3	10.36	17.56	20.56	59.89	0 22 56.17
18	77	357	5	24.8	149.16	+0.07	9.998 0768	+49.4	10.50	+17.51	20.56	59.89	0 19 0.26
19	78	358	5	3.5	149.06	-0.06	9.998 1956	49.6	10.64	17.47	20.55	59.88	0 15 4.36
20	79	359	4	39.8	148.97	0.19	9.998 3148	49.8	10.78	17.42	20.54	59.87	0 11 8.45
21	80	0	4	13.9	148.87	0.32	9.998 4346	50.1	10.91	17.38	20.54	59.86	0 7 12.54
22	81	1	3	45.7	148.78	0.43	9.998 5551	50.3	11.05	17.34	20.53	59.85	0 3 16.64
23	82	2	3	15.2	148.68	-0.52	9.998 6762	+50.6	11.19	+17.29	20.53	59.84	23 55 24.82
24	83	3	2	42.5	148.59	0.59	9.998 7980	50.9	11.33	17.25	20.52	59.83	23 51 28.92
25	84	4	2	7.7	148.50	0.64	9.998 9205	51.2	11.46	17.20	20.52	59.82	23 47 33.01
26	85	5	1	30.7	148.41	0.66	9.999 0437	51.5	11.60	17.16	20.51	59.80	23 43 37.10
27	86	6	0	51.6	148.33	0.66	9.999 1677	51.8	11.74	17.12	20.50	59.79	23 39 41.19
28	87	7	0	10.5	148.25	-0.63	9.999 2924	+52.1	11.88	+17.07	20.50	59.77	23 35 45.29
29	88	7	59	27.4	148.16	0.58	9.999 4177	52.3	12.01	17.03	20.49	59.76	23 31 49.38
30	89	8	58	42.3	148.08	0.50	9.999 5436	52.6	12.15	16.99	20.49	59.75	23 27 53.47
31	90	9	57	55.3	148.00	0.40	9.999 6701	52.8	12.29	16.95	20.48	59.73	23 23 57.57
Apr. 1	91	10	57	6.5	147.93	0.29	9.999 7971	53.0	12.43	16.90	20.47	59.72	23 20 1.66
2	92	11	56	15.9	147.85	-0.17	9.999 9243	+53.1	12.57	+16.86	20.47	59.70	23 16 5.75
3	93	12	55	23.4	147.78	-0.05	0.000 0518	+53.1	12.70	+16.82	20.46	59.68	23 12 9.84

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Apr. 1	Mo	0 40 14.73	9.099	+ 4 20 0.9	+57.96	16 1.95	8.80	-4 6.37	+0.757	0 36 8.35
2	Tu	0 43 53.17	9.104	4 43 9.7	57.76	16 1.67	8.80	3 48.26	0.752	0 40 4.91
3	We	0 47 31.74	9.110	5 6 13.6	57.55	16 1.39	8.80	3 30.28	0.746	0 44 1.46
4	Th	0 51 10.46	9.117	5 29 12.1	57.32	16 1.10	8.80	3 12.45	0.739	0 47 58.01
5	Fr	0 54 49.36	9.125	5 52 5.0	57.08	16 0.82	8.79	2 54.80	0.731	0 51 54.56
6	Sa	0 58 28.45	9.133	+ 6 14 52.0	+56.82	16 0.54	8.79	-2 37.34	+0.723	0 55 51.12
7	Su	1 2 7.75	9.142	6 37 32.5	56.55	16 0.26	8.79	2 20.08	0.714	0 59 47.67
8	Mo	1 5 47.28	9.152	7 0 6.3	56.26	15 59.98	8.79	2 3.06	0.704	1 3 44.22
9	Tu	1 9 27.05	9.162	7 22 33.0	55.96	15 59.71	8.78	1 46.28	0.694	1 7 40.78
10	We	1 13 7.08	9.173	7 44 52.3	55.64	15 59.43	8.78	1 29.75	0.683	1 11 37.33
11	Th	1 16 47.37	9.185	+ 8 7 3.7	+55.31	15 59.16	8.78	-1 13.49	+0.672	1 15 33.88
12	Fr	1 20 27.94	9.197	8 29 7.0	54.96	15 58.89	8.78	0 57.51	0.660	1 19 30.44
13	Sa	1 24 8.81	9.209	8 51 1.7	54.59	15 58.62	8.77	0 41.82	0.648	1 23 26.99
14	Su	1 27 49.97	9.222	9 12 47.4	54.21	15 58.36	8.77	0 26.43	0.635	1 27 23.54
15	Mo	1 31 31.45	9.235	9 34 23.9	53.82	15 58.10	8.77	-0 11.36	0.621	1 31 20.10
16	Tu	1 35 13.26	9.249	+ 9 55 50.8	+53.41	15 57.84	8.77	+0 3.39	+0.607	1 35 16.65
17	We	1 38 55.41	9.264	10 17 7.8	52.99	15 57.58	8.76	0 17.79	0.592	1 39 13.20
18	Th	1 42 37.92	9.279	10 38 14.5	52.56	15 57.32	8.76	0 31.83	0.577	1 43 9.76
19	Fr	1 46 20.80	9.295	10 59 10.6	52.11	15 57.06	8.76	0 45.51	0.562	1 47 6.31
20	Sa	1 50 4.07	9.311	11 19 55.8	51.65	15 56.81	8.76	0 58.80	0.545	1 51 2.86
21	Su	1 53 47.74	9.328	+11 40 29.8	+51.17	15 56.55	8.75	+1 11.68	+0.528	1 54 59.42
22	Mo	1 57 31.82	9.346	12 0 52.2	50.69	15 56.30	8.75	1 24.15	0.511	1 58 55.97
23	Tu	2 1 16.34	9.364	12 21 2.7	50.19	15 56.05	8.75	1 36.19	0.492	2 2 52.53
24	We	2 5 1.30	9.383	12 41 1.1	49.67	15 55.80	8.75	1 47.78	0.473	2 6 49.08
25	Th	2 8 46.72	9.402	13 0 47.0	49.15	15 55.55	8.75	1 58.91	0.454	2 10 45.63
26	Fr	2 12 32.62	9.422	+13 20 20.1	+48.61	15 55.30	8.74	+2 9.57	+0.434	2 14 42.19
27	Sa	2 16 19.00	9.443	13 39 40.1	48.05	15 55.05	8.74	2 19.74	0.413	2 18 38.74
28	Su	2 20 5.89	9.464	13 58 46.7	47.49	15 54.80	8.74	2 29.41	0.392	2 22 35.30
29	Mo	2 23 53.29	9.486	14 17 39.5	46.91	15 54.55	8.74	2 38.56	0.370	2 26 31.85
30	Tu	2 27 41.22	9.508	14 36 18.3	46.32	15 54.31	8.73	2 47.19	0.348	2 30 28.41
May 1	We	2 31 29.69	9.531	+14 54 42.7	+45.71	15 54.06	8.73	+2 55.27	+0.325	2 34 24.96
2	Th	2 35 18.71	9.554	15 12 52.5	45.10	15 53.82	8.73	3 2.80	0.302	2 38 21.52
3	Fr	2 39 8.29	9.578	15 30 47.3	44.46	15 53.58	8.73	3 9.78	0.279	2 42 18.07
4	Sa	2 42 58.44	9.601	15 48 26.7	43.82	15 53.34	8.72	3 16.19	0.255	2 46 14.63
5	Su	2 46 49.16	9.626	16 5 50.6	43.16	15 53.10	8.72	3 22.02	0.231	2 50 11.18
6	Mo	2 50 40.47	9.650	+16 22 58.5	+42.49	15 52.87	8.72	+3 27.27	+0.207	2 54 7.74
7	Tu	2 54 32.35	9.675	16 39 50.1	41.80	15 52.64	8.72	3 31.94	0.182	2 58 4.29
8	We	2 58 24.82	9.698	16 56 25.1	41.10	15 52.41	8.72	3 36.03	0.158	3 2 0.85
9	Th	3 2 17.87	9.721	17 12 43.2	40.40	15 52.19	8.71	3 39.53	0.134	3 5 57.40
10	Fr	3 6 11.50	9.746	17 28 44.1	39.67	15 51.98	8.71	3 42.46	0.110	3 9 53.96
11	Sa	3 10 5.70	9.770	+17 44 27.5	+38.94	15 51.76	8.71	+3 44.81	+0.086	3 13 50.51
12	Su	3 14 0.47	9.794	17 59 53.0	38.18	15 51.55	8.71	3 46.59	0.062	3 17 47.07
13	Mo	3 17 55.81	9.817	18 15 0.3	37.42	15 51.35	8.71	3 47.81	0.039	3 21 43.63
14	Tu	3 21 51.71	9.841	18 29 49.2	36.65	15 51.15	8.70	3 48.47	+0.016	3 25 40.18
15	We	3 25 48.17	9.864	18 44 19.4	35.86	15 50.95	8.70	3 48.57	-0.008	3 29 36.74
16	Th	3 29 45.18	9.887	+18 58 30.5	+35.06	15 50.76	8.70	+3 48.11	-0.031	3 33 33.29
17	Fr	3 33 42.74	9.910	+19 12 22.4	+34.25	15 50.57	8.70	+3 47.10	-0.053	3 37 29.85

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Oblig-uity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 26'	h m s
Apr. 1	91	10 57 6.5	147.93	-0.29	9.999 7971	+53.0	12.43	+16.90	20.47	59.72	23 20 1.66
2	92	11 56 15.9	147.85	0.17	9.999 9243	53.1	12.57	16.86	20.47	59.70	23 16 5.75
3	93	12 55 23.4	147.78	-0.05	0.000 0518	53.1	12.70	16.82	20.46	59.68	23 12 9.84
4	94	13 54 29.2	147.71	+0.08	0.000 1793	53.1	12.84	16.78	20.46	59.66	23 8 13.94
5	95	14 53 33.3	147.64	0.20	0.000 3067	53.0	12.98	16.74	20.45	59.64	23 4 18.03
6	96	15 52 35.7	147.56	+0.29	0.000 4338	+52.9	13.11	+16.70	20.44	59.62	23 0 22.12
7	97	16 51 36.3	147.49	0.36	0.000 5604	52.6	13.25	16.67	20.44	59.60	22 56 26.22
8	98	17 50 35.2	147.41	0.40	0.000 6864	52.3	13.39	16.63	20.43	59.58	22 52 30.31
9	99	18 49 32.2	147.34	0.41	0.000 8115	51.9	13.53	16.59	20.42	59.56	22 48 34.40
10	100	19 48 27.4	147.26	0.39	0.000 9357	51.5	13.67	16.56	20.42	59.54	22 44 38.50
11	101	20 47 20.6	147.18	+0.34	0.001 0589	+51.1	13.80	+16.52	20.41	59.52	22 40 42.59
12	102	21 46 11.8	147.09	0.26	0.001 1810	50.6	13.94	16.49	20.41	59.50	22 36 46.68
13	103	22 45 0.9	147.00	0.15	0.001 3020	50.2	14.08	16.46	20.40	59.47	22 32 50.77
14	104	23 43 47.9	146.91	+0.03	0.001 4221	49.8	14.22	16.43	20.40	59.45	22 28 54.87
15	105	24 42 32.6	146.82	-0.10	0.001 5412	49.4	14.35	16.40	20.39	59.43	22 24 58.96
16	106	25 41 15.2	146.73	-0.23	0.001 6594	+49.1	14.49	+16.37	20.39	59.40	22 21 3.05
17	107	26 39 55.5	146.63	0.36	0.001 7769	48.8	14.63	16.34	20.38	59.38	22 17 7.14
18	108	27 38 33.6	146.54	0.48	0.001 8938	48.6	14.77	16.31	20.38	59.35	22 13 11.24
19	109	28 37 9.4	146.45	0.58	0.002 0101	48.4	14.90	16.28	20.37	59.33	22 9 15.33
20	110	29 35 43.1	146.36	0.66	0.002 1259	48.1	15.04	16.26	20.36	59.30	22 5 19.42
21	111	30 34 14.7	146.27	-0.71	0.002 2412	+48.0	15.18	+16.24	20.36	59.28	22 1 23.51
22	112	31 32 44.2	146.19	0.74	0.002 3561	47.8	15.32	16.22	20.35	59.25	21 57 27.60
23	113	32 31 11.6	146.10	0.74	0.002 4707	47.7	15.45	16.20	20.35	59.22	21 53 31.70
24	114	33 29 37.0	146.02	0.71	0.002 5850	47.5	15.59	16.18	20.34	59.20	21 49 35.79
25	115	34 28 0.5	145.94	0.65	0.002 6989	47.4	15.73	16.16	20.34	59.17	21 45 39.88
26	116	35 26 22.0	145.86	-0.57	0.002 8125	+47.3	15.87	+16.14	20.33	59.14	21 41 43.97
27	117	36 24 41.8	145.79	0.47	0.002 9258	47.1	16.00	16.12	20.33	59.12	21 37 48.06
28	118	37 22 59.8	145.71	0.36	0.003 0387	46.9	16.14	16.11	20.32	59.09	21 33 52.15
29	119	38 21 16.1	145.65	0.24	0.003 1511	46.7	16.28	16.10	20.32	59.06	21 29 56.24
30	120	39 19 30.9	145.58	-0.11	0.003 2631	46.5	16.42	16.09	20.31	59.03	21 26 0.34
May 1	121	40 17 44.0	145.52	+0.02	0.003 3745	+46.2	16.55	+16.08	20.31	59.01	21 22 4.43
2	122	41 15 55.7	145.46	0.15	0.003 4851	45.9	16.69	16.07	20.30	58.98	21 18 8.52
3	123	42 14 5.9	145.40	0.25	0.003 5949	45.5	16.83	16.06	20.30	58.95	21 14 12.61
4	124	43 12 14.7	145.34	0.33	0.003 7037	45.1	16.97	16.05	20.29	58.92	21 10 16.70
5	125	44 10 22.2	145.28	0.38	0.003 8112	44.5	17.10	16.05	20.29	58.89	21 6 20.79
6	126	45 8 28.3	145.22	+0.40	0.003 9174	+43.9	17.24	+16.04	20.28	58.86	21 2 24.88
7	127	46 6 32.9	145.16	0.39	0.004 0220	43.2	17.38	16.04	20.28	58.83	20 58 28.97
8	128	47 4 36.2	145.11	0.34	0.004 1249	42.5	17.52	16.04	20.27	58.81	20 54 33.06
9	129	48 2 38.1	145.05	0.26	0.004 2259	41.7	17.65	16.04	20.27	58.78	20 50 37.15
10	130	49 0 38.4	144.98	0.15	0.004 3251	40.9	17.79	16.05	20.26	58.75	20 46 41.24
11	131	49 58 37.1	144.91	+0.03	0.004 4223	+40.1	17.93	+16.05	20.26	58.72	20 42 45.33
12	132	50 56 34.3	144.85	-0.11	0.004 5175	39.3	18.07	16.05	20.25	58.70	20 38 49.42
13	133	51 54 29.7	144.78	0.25	0.004 6108	38.5	18.21	16.06	20.25	58.67	20 34 53.51
14	134	52 52 23.5	144.71	0.38	0.004 7023	37.8	18.34	16.07	20.24	58.64	20 30 57.60
15	135	53 50 15.6	144.63	0.50	0.004 7920	37.0	18.48	16.08	20.24	58.61	20 27 1.69
16	136	54 48 5.9	144.56	-0.60	0.004 8800	+36.4	18.62	+16.09	20.24	58.58	20 23 5.78
17	137	55 45 54.6	144.50	-0.68	0.004 9665	+35.7	18.76	+16.10	20.23	58.56	20 19 9.87

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time, App.—Mean.		Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.			
		h	m	s	s	°	'	"	"	'	"	"	m	s	s	h	m	s
May 17	Fr	3	33	42.74	9.910	+19	12	22.4	+34.25	15	50.57	8.70	+3	47.10	-0.053	3	37	29.85
18	Sa	3	37	40.85	9.932	19	25	54.7	33.44	15	50.38	8.70	3	45.55	0.076	3	41	26.40
19	Su	3	41	39.50	9.955	19	39	7.3	32.61	15	50.20	8.70	3	43.46	0.098	3	45	22.96
20	Mo	3	45	38.68	9.977	19	51	59.8	31.76	15	50.02	8.69	3	40.84	0.120	3	49	19.52
21	Tu	3	49	38.39	9.999	20	4	31.9	30.91	15	49.85	8.69	3	37.68	0.142	3	53	16.07
22	We	3	53	38.63	10.021	+20	16	43.5	+30.05	15	49.67	8.69	+3	34.00	-0.164	3	57	12.63
23	Th	3	57	39.39	10.042	20	28	34.3	29.18	15	49.50	8.69	3	29.80	0.186	4	1	9.19
24	Fr	4	1	40.67	10.064	20	40	4.1	28.30	15	49.33	8.69	3	25.08	0.207	4	5	5.74
25	Sa	4	5	42.45	10.085	20	51	12.7	27.41	15	49.16	8.69	3	19.85	0.228	4	9	2.30
26	Su	4	9	44.73	10.105	21	1	59.8	26.51	15	49.00	8.69	3	14.13	0.249	4	12	58.86
27	Mo	4	13	47.51	10.126	+21	12	25.1	+25.60	15	48.84	8.68	+3	7.91	-0.269	4	16	55.41
28	Tu	4	17	50.77	10.146	21	22	28.6	24.68	15	48.68	8.68	3	1.20	0.289	4	20	51.97
29	We	4	21	54.51	10.166	21	32	9.9	23.76	15	48.52	8.68	2	54.02	0.309	4	24	48.53
30	Th	4	25	58.72	10.185	21	41	28.9	22.82	15	48.36	8.68	2	46.36	0.329	4	28	45.09
31	Fr	4	30	3.39	10.204	21	50	25.4	21.88	15	48.21	8.68	2	38.25	0.347	4	32	41.64
June 1	Sa	4	34	8.51	10.222	+21	58	59.1	+20.93	15	48.07	8.68	+2	29.69	-0.366	4	36	38.20
2	Su	4	38	14.06	10.240	22	7	9.9	19.97	15	47.92	8.68	2	20.70	0.383	4	40	34.76
3	Mo	4	42	20.02	10.257	22	14	57.6	19.00	15	47.78	8.67	2	11.30	0.400	4	44	31.31
4	Tu	4	46	26.38	10.273	22	22	22.0	18.03	15	47.64	8.67	2	1.49	0.416	4	48	27.87
5	We	4	50	33.12	10.288	22	29	22.9	17.05	15	47.51	8.67	1	51.31	0.432	4	52	24.43
6	Th	4	54	40.22	10.303	+22	36	0.2	+16.06	15	47.39	8.67	+1	40.77	-0.446	4	56	20.99
7	Fr	4	58	47.65	10.316	22	42	13.8	15.07	15	47.27	8.67	1	29.89	0.460	5	0	17.54
8	Sa	5	2	55.39	10.329	22	48	3.5	14.07	15	47.15	8.67	1	18.71	0.472	5	4	14.10
9	Su	5	7	3.42	10.340	22	53	29.2	13.07	15	47.04	8.67	1	7.24	0.483	5	8	10.66
10	Mo	5	11	11.70	10.350	22	58	30.7	12.06	15	46.94	8.67	0	55.51	0.494	5	12	7.22
11	Tu	5	15	20.22	10.359	+23	3	7.9	+11.04	15	46.84	8.67	+0	43.55	-0.503	5	16	3.77
12	We	5	19	28.95	10.367	23	7	20.8	10.03	15	46.74	8.66	0	31.38	0.511	5	20	0.33
13	Th	5	23	37.86	10.375	23	11	9.3	9.01	15	46.65	8.66	0	19.02	0.518	5	23	56.89
14	Fr	5	27	46.93	10.381	23	14	33.3	7.99	15	46.57	8.66	+0	6.51	0.524	5	27	53.45
15	Sa	5	31	56.14	10.386	23	17	32.7	6.96	15	46.49	8.66	-0	6.13	0.529	5	31	50.00
16	Su	5	36	5.46	10.390	+23	20	7.4	+5.93	15	46.42	8.66	-0	18.89	-0.534	5	35	46.56
17	Mo	5	40	14.86	10.393	23	22	17.5	4.91	15	46.35	8.66	0	31.74	0.537	5	39	43.12
18	Tu	5	44	24.33	10.395	23	24	2.9	3.88	15	46.28	8.66	0	44.65	0.539	5	43	39.68
19	We	5	48	33.84	10.397	23	25	23.5	2.84	15	46.22	8.66	0	57.61	0.540	5	47	36.23
20	Th	5	52	43.38	10.397	23	26	19.4	1.81	15	46.16	8.66	1	10.59	0.541	5	51	32.79
21	Fr	5	56	52.91	10.397	+23	26	50.5	+0.78	15	46.10	8.66	-1	23.56	-0.540	5	55	29.35
22	Sa	6	1	2.42	10.395	23	26	56.8	-0.25	15	46.05	8.66	1	36.51	0.539	5	59	25.91
23	Su	6	5	11.89	10.393	23	26	38.3	1.29	15	46.00	8.66	1	49.42	0.537	6	3	22.46
24	Mo	6	9	21.29	10.390	23	25	55.1	2.32	15	45.96	8.66	2	2.27	0.534	6	7	19.02
25	Tu	6	13	30.62	10.386	23	24	47.1	3.35	15	45.91	8.66	2	15.04	0.530	6	11	15.58
26	We	6	17	39.84	10.382	+23	23	14.4	-4.38	15	45.87	8.66	-2	27.71	-0.525	6	15	12.14
27	Th	6	21	48.95	10.377	23	21	17.0	5.40	15	45.84	8.66	2	40.25	0.520	6	19	8.69
28	Fr	6	25	57.92	10.370	23	18	55.0	6.43	15	45.81	8.66	2	52.66	0.514	6	23	5.25
29	Sa	6	30	6.73	10.363	23	16	8.3	7.45	15	45.78	8.66	3	4.92	0.507	6	27	1.81
30	Su	6	34	15.36	10.356	23	12	57.2	8.47	15	45.75	8.66	3	17.00	0.499	6	30	58.37
July 1	Mo	6	38	23.80	10.347	+23	9	21.6	-9.49	15	45.73	8.66	-3	28.88	-0.490	6	34	54.93
2	Tu	6	42	32.02	10.337	+23	5	21.6	-10.51	15	45.71	8.66	-3	40.54	-0.481	6	38	51.48

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" " "	" "	" "		" "	" "	" "	" "	23° 56' "	h m s
ay 17	137	55 45 54.6	144.50	-0.68	0.004 9665	+35.7	18.76	+16.10	20.23	58.56	20 19 9.87
18	138	56 43 41.5	144.43	0.74	0.005 0515	35.1	18.89	16.11	20.23	58.53	20 15 13.96
19	139	57 41 26.9	144.36	0.77	0.005 1350	34.5	19.03	16.13	20.22	58.51	20 11 18.05
20	140	58 39 10.6	144.29	0.77	0.005 2173	34.0	19.17	16.14	20.22	58.48	20 7 22.14
21	141	59 36 52.7	144.23	0.75	0.005 2982	33.5	19.31	16.16	20.22	58.45	20 3 26.23
22	142	60 34 33.4	144.16	-0.70	0.005 3780	+33.0	19.44	+16.18	20.21	58.43	19 59 30.32
23	143	61 32 12.6	144.10	0.62	0.005 4565	32.5	19.58	16.20	20.21	58.40	19 55 34.41
24	144	62 29 50.4	144.05	0.52	0.005 5340	32.1	19.72	16.22	20.21	58.38	19 51 38.50
25	145	63 27 26.9	144.00	0.40	0.005 6104	31.6	19.86	16.24	20.20	58.35	19 47 42.59
26	146	64 25 2.2	143.95	0.28	0.005 6857	31.2	19.99	16.26	20.20	58.33	19 43 46.68
27	147	65 22 36.3	143.90	-0.15	0.005 7600	+30.7	20.13	+16.28	20.19	58.30	19 39 50.77
28	148	66 20 9.3	143.86	-0.01	0.005 8331	30.2	20.27	16.31	20.19	58.28	19 35 54.86
29	149	67 17 41.4	143.82	+0.12	0.005 9050	29.7	20.41	16.33	20.19	58.26	19 31 58.95
30	150	68 15 12.5	143.78	0.23	0.005 9757	29.2	20.54	16.36	20.18	58.23	19 28 3.04
31	151	69 12 42.9	143.75	0.32	0.006 0450	28.6	20.68	16.39	20.18	58.21	19 24 7.12
une 1	152	70 10 12.4	143.72	+0.38	0.006 1128	+27.9	20.82	+16.42	20.18	58.19	19 20 11.21
2	153	71 7 41.3	143.69	0.41	0.006 1789	27.2	20.96	16.45	20.18	58.17	19 16 15.30
3	154	72 5 9.5	143.66	0.41	0.006 2432	26.4	21.09	16.48	20.17	58.15	19 12 19.39
4	155	73 2 37.0	143.63	0.38	0.006 3055	25.5	21.23	16.51	20.17	58.13	19 8 23.48
5	156	74 0 3.9	143.61	0.31	0.006 3657	24.6	21.37	16.54	20.17	58.11	19 4 27.57
6	157	74 57 30.1	143.58	+0.21	0.006 4235	+23.6	21.51	+16.57	20.16	58.09	19 0 31.66
7	158	75 54 55.5	143.55	+0.10	0.006 4790	22.6	21.64	16.60	20.16	58.07	18 56 35.74
8	159	76 52 20.3	143.51	-0.03	0.006 5320	21.6	21.78	16.64	20.16	58.05	18 52 39.83
9	160	77 49 44.2	143.48	0.18	0.006 5825	20.5	21.92	16.67	20.16	58.03	18 48 43.92
10	161	78 47 7.4	143.45	0.32	0.006 6305	19.5	22.06	16.70	20.15	58.02	18 44 48.01
11	162	79 44 29.7	143.41	-0.44	0.006 6761	+18.5	22.19	+16.74	20.15	58.00	18 40 52.10
12	163	80 41 51.1	143.37	0.55	0.006 7192	17.5	22.33	16.77	20.15	57.98	18 36 56.19
13	164	81 39 11.6	143.34	0.64	0.006 7600	16.5	22.47	16.81	20.15	57.97	18 33 0.28
14	165	82 36 31.2	143.30	0.70	0.006 7986	15.6	22.61	16.85	20.15	57.95	18 29 4.36
15	166	83 33 49.9	143.26	0.74	0.006 8350	14.8	22.75	16.88	20.14	57.94	18 25 8.45
16	167	84 31 7.8	143.23	-0.75	0.006 8694	+13.9	22.88	+16.92	20.14	57.93	18 21 12.54
17	168	85 28 24.8	143.19	0.73	0.006 9018	13.1	23.02	16.96	20.14	57.91	18 17 16.63
18	169	86 25 41.1	143.16	0.69	0.006 9324	12.4	23.16	17.00	20.14	57.90	18 13 20.72
19	170	87 22 56.6	143.13	0.62	0.006 9612	11.6	23.30	17.03	20.14	57.89	18 9 24.80
20	171	88 20 11.4	143.10	0.53	0.006 9882	10.9	23.43	17.07	20.14	57.88	18 5 28.89
21	172	89 17 25.5	143.08	-0.41	0.007 0137	+10.3	23.57	+17.11	20.14	57.87	18 1 32.98
22	173	90 14 39.1	143.06	0.28	0.007 0376	9.6	23.71	17.14	20.14	57.86	17 57 37.07
23	174	91 11 52.2	143.04	0.14	0.007 0600	9.0	23.85	17.18	20.13	57.85	17 53 41.16
24	175	92 9 4.9	143.02	-0.01	0.007 0810	8.5	23.98	17.22	20.13	57.84	17 49 45.25
25	176	93 6 17.3	143.01	+0.12	0.007 1006	7.9	24.12	17.26	20.13	57.83	17 45 49.33
26	177	94 3 29.4	143.00	+0.24	0.007 1188	+ 7.3	24.26	+17.29	20.13	57.82	17 41 53.42
27	178	95 0 41.4	143.00	0.34	0.007 1355	6.6	24.40	17.33	20.13	57.81	17 37 57.51
28	179	95 57 53.4	143.00	0.41	0.007 1507	6.0	24.53	17.37	20.13	57.81	17 34 1.60
29	180	96 55 5.5	143.00	0.45	0.007 1643	5.3	24.67	17.41	20.13	57.80	17 30 5.69
30	181	97 52 17.6	143.01	0.46	0.007 1760	4.5	24.81	17.44	20.13	57.80	17 26 9.77
July 1	182	98 49 30.0	143.02	+0.44	0.007 1859	+ 3.7	24.95	+17.48	20.13	57.79	17 22 13.86
2	183	99 46 42.6	143.03	+0.38	0.007 1937	+ 2.8	25.08	+17.51	20.13	57.79	17 18 17.95

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
July 1	Mo	6 38 23.80	10.347	+23 9 21.6	-9.49	15 45.73	8.66	-3 28.88	-0.490	6 34 54.93
2	Tu	6 42 32.02	10.337	23 5 21.6	10.51	15 45.71	8.66	3 40.54	0.481	6 38 51.48
3	We	6 46 40.00	10.327	23 0 57.3	11.52	15 45.70	8.66	3 51.96	0.470	6 42 48.04
4	Th	6 50 47.71	10.315	22 56 8.9	12.52	15 45.69	8.65	4 3.11	0.459	6 46 44.60
5	Fr	6 54 55.13	10.303	22 50 56.4	13.52	15 45.69	8.65	4 13.98	0.446	6 50 41.16
6	Sa	6 59 2.24	10.289	+22 45 20.1	-14.51	15 45.69	8.65	-4 24.53	-0.433	6 54 37.71
7	Su	7 3 9.02	10.275	22 39 20.0	15.49	15 45.70	8.66	4 34.75	0.418	6 58 34.27
8	Mo	7 7 15.44	10.259	22 32 56.4	16.47	15 45.72	8.66	4 44.61	0.403	7 2 30.83
9	Tu	7 11 21.47	10.243	22 26 9.3	17.45	15 45.74	8.66	4 54.08	0.386	7 6 27.38
10	We	7 15 27.09	10.225	22 18 59.0	18.41	15 45.76	8.66	5 3.15	0.369	7 10 23.94
11	Th	7 19 32.29	10.207	+22 11 25.6	-19.37	15 45.80	8.66	-5 11.79	-0.351	7 14 20.50
12	Fr	7 23 37.05	10.189	22 3 29.3	20.32	15 45.83	8.66	5 19.92	0.333	7 18 17.06
13	Sa	7 27 41.34	10.169	21 55 10.3	21.26	15 45.88	8.66	5 27.73	0.312	7 22 13.61
14	Su	7 31 45.15	10.148	21 46 28.9	22.19	15 45.92	8.66	5 34.98	0.292	7 26 10.17
15	Mo	7 35 48.46	10.127	21 37 25.2	23.11	15 45.98	8.66	5 41.73	0.271	7 30 6.73
16	Tu	7 39 51.26	10.106	+21 27 59.4	-24.08	15 46.03	8.66	-5 47.98	-0.249	7 34 3.28
17	We	7 43 53.54	10.084	21 18 11.8	24.94	15 46.10	8.66	5 53.70	0.227	7 37 59.84
18	Th	7 47 55.28	10.061	21 8 2.5	25.83	15 46.16	8.66	5 58.89	0.205	7 41 56.40
19	Fr	7 51 56.48	10.038	20 57 31.8	26.72	15 46.23	8.66	6 3.53	0.182	7 45 52.95
20	Sa	7 55 57.12	10.015	20 46 40.0	27.60	15 46.30	8.66	6 7.61	0.158	7 49 49.51
21	Su	7 59 57.19	9.991	+20 35 27.1	-28.47	15 46.38	8.66	-6 11.13	-0.135	7 53 46.07
22	Mo	8 3 56.70	9.968	20 23 53.6	29.32	15 46.46	8.66	6 14.08	0.111	7 57 42.62
23	Tu	8 7 55.64	9.944	20 11 59.5	30.18	15 46.54	8.66	6 16.46	0.087	8 1 39.18
24	We	8 11 53.99	9.919	19 59 45.2	31.01	15 46.63	8.66	6 18.26	0.063	8 5 35.74
25	Th	8 15 51.77	9.895	19 47 10.8	31.84	15 46.71	8.66	6 19.48	0.039	8 9 32.29
26	Fr	8 19 48.97	9.871	+19 34 16.7	-32.66	15 46.81	8.67	-6 20.12	-0.015	8 13 28.85
27	Sa	8 23 45.59	9.847	19 21 3.0	33.48	15 46.90	8.67	6 20.19	+0.009	8 17 25.40
28	Su	8 27 41.63	9.823	19 7 29.9	34.27	15 47.00	8.67	6 19.67	0.034	8 21 21.96
29	Mo	8 31 37.09	9.799	18 53 37.9	35.06	15 47.10	8.67	6 18.57	0.053	8 25 18.52
30	Tu	8 35 31.97	9.774	18 39 27.0	35.84	15 47.20	8.67	6 16.89	0.082	8 29 15.07
31	We	8 39 26.26	9.750	+18 24 57.6	-36.60	15 47.31	8.67	-6 14.63	+0.106	8 33 11.63
Aug. 1	Th	8 43 19.96	9.725	18 10 10.1	37.35	15 47.42	8.67	6 11.78	0.131	8 37 8.18
2	Fr	8 47 13.08	9.701	17 55 4.6	38.10	15 47.54	8.67	6 8.34	0.156	8 41 4.74
3	Sa	8 51 5.61	9.676	17 39 41.5	38.82	15 47.66	8.67	6 4.31	0.180	8 45 1.30
4	Su	8 54 57.54	9.651	17 24 1.1	39.54	15 47.79	8.67	5 59.69	0.205	8 48 57.85
5	Mo	8 58 48.88	9.627	+17 8 3.7	-40.24	15 47.92	8.68	-5 54.48	+0.230	8 52 54.41
6	Tu	9 2 39.63	9.602	16 51 49.6	40.93	15 48.06	8.68	5 48.67	0.255	8 56 50.96
7	We	9 6 29.78	9.577	16 35 19.2	41.60	15 48.20	8.68	5 42.26	0.279	9 0 47.52
8	Th	9 10 19.33	9.552	16 18 32.8	42.26	15 48.35	8.68	5 35.26	0.304	9 4 44.07
9	Fr	9 14 8.29	9.528	16 1 30.6	42.91	15 48.50	8.68	5 27.67	0.329	9 8 40.63
10	Sa	9 17 56.66	9.503	+15 44 13.0	-43.55	15 48.66	8.68	-5 19.48	+0.353	9 12 37.18
11	Su	9 21 44.45	9.479	15 26 40.3	44.17	15 48.82	8.68	5 10.71	0.378	9 16 33.74
12	Mo	9 25 31.65	9.455	15 8 52.9	44.78	15 48.99	8.69	5 1.36	0.402	9 20 30.29
13	Tu	9 29 18.27	9.431	14 50 51.1	45.37	15 49.16	8.69	4 51.43	0.426	9 24 26.85
14	We	9 33 4.33	9.407	14 32 35.1	45.95	15 49.33	8.69	4 40.92	0.440	9 28 23.40
15	Th	9 36 49.82	9.384	+14 14 5.3	-46.52	15 49.51	8.69	-4 29.86	+0.472	9 32 19.95
16	Fr	9 40 34.76	9.361	+13 55 22.0	-47.08	15 49.69	8.69	-4 18.25	+0.495	9 36 16.51

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 26'	h m s
July	1	182 98 49 30.0	143.02	+0.44	0.007 1859	+ 3.7	24.95	+17.48	20.13	57.79	17 22 13.86
	2	183 99 46 42.6	143.08	0.38	0.007 1937	2.8	25.08	17.51	20.13	57.79	17 18 17.95
	3	184 100 43 55.4	143.04	0.29	0.007 1993	1.9	25.22	17.55	20.13	57.78	17 14 22.04
	4	185 101 41 8.4	143.06	0.18	0.007 2026	+ 0.9	25.36	17.58	20.13	57.78	17 10 26.13
	5	186 102 38 21.7	143.06	+0.05	0.007 2034	- 0.2	25.50	17.62	20.13	57.78	17 6 30.22
	6	187 103 35 35.2	143.07	-0.08	0.007 2017	- 1.3	25.63	+17.65	20.13	57.78	17 2 34.31
	7	188 104 32 48.9	143.07	0.22	0.007 1974	2.4	25.77	17.68	20.13	57.78	16 58 38.39
	8	189 105 30 2.7	143.08	0.35	0.007 1904	3.5	25.91	17.71	20.13	57.78	16 54 42.48
	9	190 106 27 16.6	143.08	0.46	0.007 1808	4.6	26.05	17.74	20.13	57.77	16 50 46.57
	10	191 107 24 30.7	143.09	0.56	0.007 1685	5.6	26.18	17.77	20.13	57.77	16 46 50.66
	11	192 108 21 44.8	143.09	-0.63	0.007 1538	- 6.7	26.32	+17.80	20.13	57.78	16 42 54.75
	12	193 109 18 58.9	143.09	0.68	0.007 1365	7.7	26.46	17.83	20.13	57.78	16 38 58.84
	13	194 110 16 13.2	143.10	0.70	0.007 1169	8.6	26.60	17.86	20.13	57.78	16 35 2.93
	14	195 111 13 27.5	143.10	0.70	0.007 0950	9.6	26.74	17.88	20.13	57.78	16 31 7.02
	15	196 112 10 41.8	143.10	0.67	0.007 0710	10.5	26.87	17.91	20.13	57.78	16 27 11.10
	16	197 113 7 56.3	143.11	-0.61	0.007 0448	-11.3	27.01	+17.94	20.13	57.79	16 23 15.19
	17	198 114 5 10.9	143.11	0.51	0.007 0167	12.1	27.15	17.97	20.14	57.79	16 19 19.28
	18	199 115 2 25.7	143.12	0.40	0.006 9867	12.9	27.29	17.99	20.14	57.79	16 15 23.37
	19	200 115 59 40.7	143.13	0.28	0.006 9549	13.6	27.42	18.01	20.14	57.80	16 11 27.46
	20	201 116 56 55.9	143.14	0.16	0.006 9214	14.2	27.56	18.03	20.14	57.80	16 7 31.55
	21	202 117 54 11.4	143.16	-0.03	0.006 8865	-14.9	27.70	+18.05	20.14	57.81	16 3 35.64
	22	203 118 51 27.4	143.18	+0.11	0.006 8500	15.5	27.84	18.07	20.14	57.81	15 59 39.73
	23	204 119 48 43.8	143.20	0.23	0.006 8122	16.0	27.97	18.09	20.15	57.82	15 55 43.82
	24	205 120 46 0.8	143.22	0.33	0.006 7731	16.6	28.11	18.10	20.15	57.82	15 51 47.91
	25	206 121 43 18.5	143.25	0.41	0.006 7327	17.1	28.25	18.12	20.15	57.83	15 47 52.00
	26	207 122 40 37.0	143.29	+0.47	0.006 6910	-17.7	28.39	+18.13	20.15	57.83	15 43 56.09
	27	208 123 37 56.3	143.33	0.49	0.006 6479	18.3	28.52	18.15	20.15	57.84	15 40 0.18
	28	209 124 35 16.6	143.37	0.47	0.006 6033	18.9	28.66	18.16	20.16	57.85	15 36 4.27
	29	210 125 32 38.0	143.41	0.42	0.006 5572	19.6	28.80	18.17	20.16	57.85	15 32 8.36
	30	211 126 30 0.5	143.46	0.34	0.006 5093	20.3	28.94	18.18	20.16	57.86	15 28 12.45
Aug.	31	212 127 27 24.1	143.51	+0.24	0.006 4596	-21.1	29.07	+18.19	20.16	57.87	15 24 16.54
	1	213 128 24 48.8	143.55	+0.11	0.006 4078	22.0	29.21	18.19	20.16	57.88	15 20 20.63
	2	214 129 22 14.7	143.60	-0.02	0.006 3540	22.9	29.35	18.20	20.17	57.89	15 16 24.72
	3	215 130 19 41.7	143.65	0.15	0.006 2980	23.8	29.49	18.20	20.17	57.89	15 12 28.81
	4	216 131 17 9.8	143.70	0.28	0.006 2397	24.8	29.62	18.20	20.17	57.90	15 8 32.90
	5	217 132 14 39.1	143.74	-0.39	0.006 1791	-25.7	29.76	+18.20	20.18	57.91	15 4 36.99
	6	218 133 12 9.4	143.78	0.49	0.006 1161	26.7	29.90	18.20	20.18	57.92	15 0 41.08
	7	219 134 9 40.7	143.83	0.57	0.006 0508	27.7	30.04	18.20	20.18	57.93	14 56 45.17
	8	220 135 7 13.1	143.87	0.63	0.006 9832	28.6	30.17	18.20	20.18	57.94	14 52 49.26
	9	221 136 4 46.4	143.91	0.65	0.006 9134	29.6	30.31	18.19	20.19	57.94	14 48 53.35
	10	222 137 2 20.7	143.95	-0.64	0.006 8413	-30.5	30.45	+18.19	20.19	57.95	14 44 57.44
	11	223 137 59 56.0	143.99	0.61	0.006 7672	31.3	30.59	18.18	20.19	57.96	14 41 1.53
	12	224 138 57 32.2	144.03	0.56	0.006 6911	32.1	30.72	18.17	20.20	57.97	14 37 5.62
	13	225 139 55 9.4	144.07	0.48	0.006 6131	32.9	30.86	18.16	20.20	57.98	14 33 9.72
	14	226 140 52 47.6	144.11	0.38	0.006 5334	33.6	31.00	18.15	20.21	57.99	14 29 13.81
	15	227 141 50 26.7	144.15	-0.27	0.006 4519	-34.3	31.14	+18.14	20.21	57.99	14 25 17.90
	16	228 142 48 6.9	144.19	-0.15	0.006 3689	-34.9	31.28	+18.12	20.21	58.00	14 21 21.99

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sider. or Rig. sion
		^h ^m ^s	^s	[°] ['] ["]	["]	['] ["]	["]	^m ^s	^s	^h ^m ^s
Aug. 16	Fr	9 40 34.76	9.361	+13 55 22.0	-47.08	15 49.69	8.69	- 4 18.25	+0.495	9 3
17	Sa	9 44 19.15	9.339	13 36 25.5	47.62	15 49.87	8.69	4 6.09	0.518	9 4
18	Su	9 48 3.01	9.317	13 17 16.1	48.15	15 50.06	8.70	3 53.39	0.540	9 4
19	Mo	9 51 46.35	9.295	12 57 54.2	48.67	15 50.25	8.70	3 40.18	0.561	9 4
20	Tu	9 55 29.19	9.275	12 38 20.0	49.18	15 50.44	8.70	3 26.46	0.582	9 5
21	We	9 59 11.54	9.255	+12 18 33.8	-49.67	15 50.64	8.70	- 3 12.26	+0.602	9 5
22	Th	10 2 53.41	9.235	11 58 35.8	50.15	15 50.83	8.70	2 57.58	0.621	9 5
23	Fr	10 6 34.83	9.217	11 38 26.5	50.62	15 51.03	8.70	2 42.44	0.640	10
24	Sa	10 10 15.81	9.199	11 18 6.0	51.08	15 51.23	8.71	2 26.86	0.658	10
25	Su	10 13 56.37	9.182	10 57 34.7	51.52	15 51.43	8.71	2 10.87	0.675	10 1
26	Mo	10 17 36.53	9.165	+10 36 52.9	-51.96	15 51.64	8.71	- 1 54.48	+0.691	10 1
27	Tu	10 21 16.30	9.149	10 16 0.8	52.38	15 51.84	8.71	1 37.70	0.707	10 1
28	We	10 24 55.70	9.134	9 54 58.9	52.78	15 52.05	8.71	1 20.55	0.722	10 2
29	Th	10 28 34.75	9.120	9 33 47.3	53.18	15 52.28	8.72	1 3.05	0.736	10 2
30	Fr	10 32 13.47	9.106	9 12 26.5	53.55	15 52.47	8.72	0 45.21	0.750	10 3
31	Sa	10 35 51.86	9.093	+ 8 50 56.7	-53.92	15 52.69	8.72	- 0 27.04	+0.763	10 3
Sept. 1	Su	10 39 29.95	9.081	8 29 18.4	54.27	15 52.91	8.72	- 0 8.57	0.776	10 3
2	Mo	10 43 7.73	9.069	8 7 31.8	54.61	15 53.13	8.72	+ 0 10.19	0.788	10 4
3	Tu	10 46 45.24	9.057	7 45 37.3	54.93	15 53.35	8.73	0 29.23	0.799	10 4
4	We	10 50 22.49	9.047	7 23 35.3	55.23	15 53.59	8.73	0 48.54	0.810	10 5
5	Th	10 53 59.48	9.036	+ 7 1 26.1	-55.53	15 53.83	8.73	+ 1 8.11	+0.820	10 5
6	Fr	10 57 36.23	9.027	6 39 10.0	55.81	15 54.07	8.73	1 27.91	0.830	10 5
7	Sa	11 1 12.76	9.018	6 16 47.4	56.07	15 54.31	8.73	1 47.93	0.839	11
8	Su	11 4 49.08	9.010	5 54 18.6	56.32	15 54.55	8.74	2 8.16	0.847	11
9	Mo	11 8 25.22	9.002	5 31 44.0	56.56	15 54.80	8.74	2 28.58	0.855	11 1
10	Tu	11 12 1.17	8.995	+ 5 9 3.9	-56.78	15 55.05	8.74	+ 2 43.18	+0.861	11 1
11	We	11 15 36.97	8.989	4 46 18.7	56.99	15 55.31	8.74	3 9.93	0.868	11 1
12	Th	11 19 12.63	8.983	4 23 28.6	57.18	15 55.56	8.75	3 30.82	0.873	11 2
13	Fr	11 22 48.17	8.979	4 0 34.0	57.36	15 55.82	8.75	3 51.84	0.878	11 2
14	Sa	11 26 23.60	8.975	3 37 35.3	57.52	15 56.08	8.75	4 12.96	0.882	11 3
15	Su	11 29 58.95	8.971	+ 3 14 32.8	-57.68	15 56.34	8.75	+ 4 34.17	+0.885	11 3
16	Mo	11 33 34.23	8.969	2 51 26.7	57.82	15 56.61	8.75	4 55.44	0.887	11 3
17	Tu	11 37 9.46	8.968	2 28 17.5	57.94	15 56.88	8.76	5 16.75	0.889	11 4
18	We	11 40 44.68	8.967	2 5 5.4	58.06	15 57.14	8.76	5 38.09	0.889	11 4
19	Th	11 44 19.90	8.968	1 41 50.7	58.16	15 57.40	8.76	5 59.42	0.888	11 5
20	Fr	11 47 55.14	8.969	+ 1 18 33.8	-58.25	15 57.67	8.76	+ 6 20.73	+0.887	11 5
21	Sa	11 51 30.43	8.972	0 55 14.9	58.32	15 57.93	8.77	6 41.99	0.884	11 5
22	Su	11 55 5.81	8.976	0 31 54.4	58.38	15 58.19	8.77	7 3.17	0.881	12
23	Mo	11 58 41.28	8.981	+ 0 8 32.5	58.43	15 58.46	8.77	7 24.26	0.876	12
24	Tu	12 2 16.88	8.986	- 0 14 50.4	58.47	15 58.72	8.77	7 45.21	0.870	12 1
25	We	12 5 52.63	8.993	- 0 38 13.9	-58.49	15 58.99	8.78	+ 8 6.01	+0.863	12 1
26	Th	12 9 28.55	9.001	1 1 37.9	58.50	15 59.25	8.78	8 26.64	0.856	12 1
27	Fr	12 13 4.66	9.009	1 25 1.8	58.49	15 59.52	8.78	8 47.08	0.847	12 2
28	Sa	12 16 40.99	9.019	1 48 25.3	58.47	15 59.79	8.78	9 7.30	0.838	12 2
29	Su	12 20 17.55	9.029	2 11 48.2	58.43	16 0.05	8.79	9 27.29	0.828	12 2
30	Mo	12 23 54.37	9.040	- 2 35 10.0	-58.38	16 0.32	8.79	+ 9 47.03	+0.817	12 3
Oct. 1	Tu	12 27 31.46	9.051	- 2 58 30.3	-58.31	16 0.59	8.79	+10 6.50	+0.805	12 3

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" " "	" "	" "			" "	" "	" "	23° 28' "	h m s
Aug. 16	228	142 48 6.9	144.19	-0.15	0.005 3689	-34.9	31.28	+18.12	20.21	58.00	14 21 21.99
17	229	143 45 48.0	144.24	-0.02	0.005 2845	35.4	31.41	18.11	20.22	58.01	14 17 26.08
18	230	144 43 30.2	144.28	+0.12	0.005 1988	35.9	31.55	18.09	20.22	58.02	14 13 30.17
19	231	145 41 13.6	144.33	0.24	0.005 1120	36.4	31.69	18.07	20.22	58.03	14 9 34.26
20	232	146 38 58.1	144.38	0.34	0.005 0242	36.8	31.83	18.05	20.23	58.03	14 5 38.36
21	233	147 36 43.9	144.44	+0.42	0.004 9355	-37.1	31.96	+18.03	20.23	58.04	14 1 42.45
22	234	148 34 31.0	144.49	0.47	0.004 8460	37.5	32.10	18.01	20.24	58.05	13 57 46.54
23	235	149 32 19.6	144.56	0.49	0.004 7557	37.8	32.24	17.98	20.24	58.05	13 53 50.63
24	236	150 30 9.8	144.62	0.48	0.004 6647	38.1	32.38	17.96	20.25	58.06	13 49 54.72
25	237	151 28 1.6	144.70	0.44	0.004 5729	38.5	32.51	17.93	20.25	58.07	13 45 58.82
26	238	152 25 55.2	144.77	+0.37	0.004 4801	-38.9	32.65	+17.90	20.25	58.07	13 42 2.91
27	239	153 23 50.6	144.85	0.28	0.004 3864	39.3	32.79	17.88	20.26	58.08	13 38 7.00
28	240	154 21 47.8	144.93	0.16	0.004 2915	39.8	32.93	17.85	20.26	58.08	13 34 11.09
29	241	155 19 47.0	145.00	+0.03	0.004 1954	40.3	33.06	17.81	20.27	58.09	13 30 15.18
30	242	156 17 48.0	145.08	-0.10	0.004 0980	40.9	33.20	17.78	20.27	58.09	13 26 19.28
Sept. 1	243	157 15 50.9	145.16	-0.23	0.003 9992	-41.5	33.34	+17.75	20.28	58.10	13 22 23.37
2	244	158 13 55.6	145.24	0.35	0.003 8987	42.2	33.48	17.72	20.28	58.10	13 18 27.46
3	245	159 12 2.3	145.31	0.45	0.003 7967	42.8	33.61	17.68	20.29	58.10	13 14 31.56
4	246	160 10 10.7	145.39	0.53	0.003 6931	43.5	33.75	17.64	20.29	58.11	13 10 35.65
5	247	161 8 21.0	145.46	0.58	0.003 5878	44.2	33.89	17.61	20.30	58.11	13 6 39.74
6	248	162 6 33.0	145.54	-0.60	0.003 4809	-44.9	34.03	+17.57	20.30	58.11	13 2 43.83
7	249	163 4 46.7	145.61	0.60	0.003 3724	45.5	34.16	17.53	20.31	58.11	12 58 47.93
8	250	164 3 2.2	145.68	0.58	0.003 2623	46.2	34.30	17.49	20.31	58.11	12 54 52.02
9	251	165 1 19.2	145.75	0.53	0.003 1507	46.8	34.44	17.45	20.32	58.11	12 50 56.11
10	252	165 59 38.0	145.81	0.46	0.003 0378	47.3	34.58	17.41	20.32	58.11	12 47 0.20
11	253	166 57 58.3	145.88	-0.37	0.002 9235	-47.9	34.71	+17.37	20.33	58.11	12 43 4.30
12	254	167 56 20.3	145.95	0.28	0.002 8080	48.4	34.85	17.32	20.33	58.11	12 39 8.39
13	255	168 54 43.8	146.01	0.14	0.002 6914	48.8	34.99	17.28	20.34	58.11	12 35 12.48
14	256	169 53 8.9	146.08	-0.01	0.002 5738	49.2	35.13	17.24	20.34	58.10	12 31 16.58
15	257	170 51 35.6	146.15	+0.11	0.002 4553	49.5	35.26	17.19	20.35	58.10	12 27 20.67
16	258	171 50 3.9	146.21	+0.23	0.002 3362	-49.7	35.40	+17.15	20.35	58.10	12 23 24.76
17	259	172 48 33.8	146.28	0.33	0.002 2166	49.9	35.54	17.10	20.36	58.09	12 19 28.86
18	260	173 47 5.4	146.35	0.42	0.002 0966	50.0	35.68	17.06	20.37	58.09	12 15 32.95
19	261	174 45 38.7	146.42	0.48	0.001 9764	50.1	35.82	17.01	20.37	58.08	12 11 37.04
20	262	175 44 13.7	146.50	0.51	0.001 8562	50.1	35.95	16.96	20.38	58.08	12 7 41.14
21	263	176 42 50.6	146.58	+0.51	0.001 7360	-50.1	36.09	+16.92	20.38	58.07	12 3 45.23
22	264	177 41 29.4	146.66	0.47	0.001 6159	50.0	36.23	16.87	20.39	58.06	11 59 49.32
23	265	178 40 10.2	146.75	0.40	0.001 4959	50.0	36.37	16.82	20.39	58.05	11 55 53.42
24	266	179 38 53.2	146.84	0.30	0.001 3761	49.9	36.50	16.78	20.40	58.04	11 51 57.51
25	267	180 37 38.3	146.93	0.18	0.001 2563	49.9	36.64	16.73	20.41	58.04	11 48 1.60
26	268	181 36 25.7	147.02	+0.05	0.001 1364	-50.0	36.78	+16.68	20.41	58.03	11 44 5.70
27	269	182 35 15.4	147.12	-0.08	0.001 0163	50.1	36.92	16.63	20.42	58.01	11 40 9.79
28	270	183 34 7.4	147.21	0.21	0.000 8960	50.2	37.05	16.59	20.42	58.00	11 36 13.88
29	271	184 33 1.7	147.31	0.33	0.000 7753	50.4	37.19	16.54	20.43	57.99	11 32 17.98
30	272	185 31 58.3	147.41	0.43	0.000 6541	50.6	37.33	16.49	20.43	57.98	11 28 22.07
Oct. 1	273	186 30 57.2	147.50	-0.52	0.000 5324	-50.8	37.47	+16.45	20.44	57.96	11 24 26.16
2	274	187 29 58.3	147.59	-0.58	0.000 4101	-51.1	37.60	+16.40	20.44	57.95	11 20 30.26

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h	m	s	s	°	'	"	"	'	"	m	s	h m s
Oct. 1	Tu	12	27	31.46	9.061	—	2	58	30.3	—58.31	16	0.59	8.79	+10 6.50 +0.805 12 37 37.95
2	We	12	31	8.83	9.064		3	21	48.8	58.22	16	0.87	8.79	10 25.67 0.792 12 41 34.51
3	Th	12	34	46.51	9.077		3	45	5.1	58.12	16	1.14	8.80	10 44.54 0.780 12 45 31.06
4	Fr	12	38	24.52	9.091		4	8	18.8	58.01	16	1.41	8.80	11 3.09 0.766 12 49 27.61
5	Sa	12	42	2.87	9.105		4	31	29.6	57.88	16	1.69	8.80	11 21.30 0.751 12 53 24.16
6	Su	12	45	41.57	9.120	—	4	54	37.0	—57.73	16	1.97	8.80	+11 39.15 +0.736 12 57 20.72
7	Mo	12	49	20.65	9.136		5	17	40.8	57.57	16	2.25	8.81	11 56.62 0.720 13 1 17.27
8	Tu	12	53	0.12	9.153		5	40	40.4	57.39	16	2.53	8.81	12 13.70 0.703 13 5 13.82
9	We	12	56	40.00	9.171		6	3	35.6	57.20	16	2.81	8.81	12 30.37 0.686 13 9 10.37
10	Th	13	0	20.31	9.189		6	26	26.0	56.99	16	3.09	8.81	12 46.62 0.668 13 13 6.93
11	Fr	13	4	1.06	9.207	—	6	49	11.1	—56.76	16	3.37	8.82	+13 2.42 +0.649 13 17 3.48
12	Sa	13	7	42.26	9.227		7	11	50.7	56.52	16	3.65	8.82	13 17.77 0.630 13 21 0.03
13	Su	13	11	23.95	9.247		7	34	24.3	56.27	16	3.93	8.82	13 32.64 0.609 13 24 56.59
14	Mo	13	15	6.13	9.268		7	56	51.5	55.99	16	4.22	8.82	13 47.01 0.588 13 28 53.14
15	Tu	13	18	48.82	9.290		8	19	12.0	55.71	16	4.49	8.83	14 0.87 0.566 13 32 49.63
16	We	13	22	32.04	9.312	—	8	41	25.5	—55.41	16	4.77	8.83	+14 14.20 +0.544 13 36 46.25
17	Th	13	26	15.82	9.336		9	3	31.5	55.09	16	5.05	8.83	14 26.98 0.521 13 40 42.80
18	Fr	13	30	0.17	9.360		9	25	23.7	54.75	16	5.33	8.83	14 39.19 0.496 13 44 39.35
19	Sa	13	33	45.11	9.385		9	47	19.7	54.41	16	5.60	8.84	14 50.80 0.471 13 48 35.91
20	Su	13	37	30.66	9.411		10	9	1.2	54.04	16	5.87	8.84	15 1.80 0.445 13 52 32.46
21	Mo	13	41	16.85	9.439	—	10	30	33.8	—53.67	16	6.14	8.84	+15 12.16 +0.418 13 56 29.01
22	Tu	13	45	3.71	9.466		10	51	57.2	53.27	16	6.40	8.84	15 21.86 0.390 14 0 25.57
23	We	13	48	51.24	9.495		11	13	10.9	52.96	16	6.67	8.85	15 30.88 0.361 14 4 22.12
24	Th	13	52	39.47	9.524		11	34	14.5	52.44	16	6.93	8.85	15 39.21 0.332 14 8 18.67
25	Fr	13	56	28.41	9.554		11	55	7.8	51.99	16	7.18	8.85	15 46.82 0.302 14 12 15.23
26	Sa	14	0	18.08	9.585	—	12	15	50.2	—51.53	16	7.44	8.85	+15 53.70 +0.271 14 16 11.78
27	Su	14	4	8.50	9.616		12	36	21.4	51.06	16	7.70	8.86	15 59.84 0.240 14 20 8.33
28	Mo	14	7	59.67	9.648		12	56	41.0	50.56	16	7.95	8.86	16 5.22 0.208 14 24 4.89
29	Tu	14	11	51.61	9.680		13	16	48.5	50.05	16	8.20	8.86	16 9.83 0.176 14 28 1.44
30	We	14	15	44.33	9.713		13	36	43.5	49.52	16	8.45	8.86	16 13.67 0.144 14 31 58.00
31	Th	14	19	37.83	9.746	—	13	56	25.7	—48.96	16	8.70	8.87	+16 16.72 +0.111 14 35 54.55
Nov. 1	Fr	14	23	32.13	9.779		14	15	54.5	48.41	16	8.95	8.87	16 18.98 0.077 14 39 51.11
2	Sa	14	27	27.23	9.813		14	35	9.5	47.83	16	9.20	8.87	16 20.43 0.044 14 43 47.66
3	Su	14	31	23.14	9.846		14	54	10.5	47.24	16	9.44	8.87	16 21.08 +0.010 14 47 44.21
4	Mo	14	35	19.86	9.880		15	12	56.8	46.62	16	9.69	8.87	16 20.91 —0.024 14 51 40.77
5	Tu	14	39	17.40	9.915	—	15	31	28.2	—45.99	16	9.94	8.88	+16 19.93 —0.058 14 55 37.32
6	We	14	43	15.76	9.949		15	49	44.2	45.34	16	10.18	8.88	16 18.12 0.092 14 59 33.68
7	Th	14	47	14.94	9.983		16	7	44.3	44.67	16	10.42	8.88	16 15.49 0.127 15 3 30.43
8	Fr	14	51	14.95	10.018		16	25	28.2	43.98	16	10.66	8.88	16 12.03 0.161 15 7 26.99
9	Sa	14	55	15.79	10.052		16	42	55.4	43.28	16	10.90	8.89	16 7.75 0.196 15 11 23.55
10	Su	14	59	17.46	10.087	—	17	0	5.6	—42.56	16	11.14	8.89	+16 2.64 —0.230 15 15 20.10
11	Mo	15	3	19.95	10.121		17	16	58.4	41.83	16	11.37	8.89	15 56.70 0.265 15 19 16.66
12	Tu	15	7	23.27	10.156		17	33	33.3	41.08	16	11.61	8.89	15 49.94 0.299 15 23 13.21
13	We	15	11	27.42	10.190		17	49	50.0	40.31	16	11.83	8.89	15 42.35 0.334 15 27 9.77
14	Th	15	15	32.40	10.225		18	5	48.0	39.52	16	12.06	8.90	15 33.92 0.368 15 31 6.32
15	Fr	15	19	38.21	10.259	—	18	21	27.1	—38.72	16	12.28	8.90	+15 24.67 —0.403 15 35 2.88
16	Sa	15	23	44.84	10.294		18	36	46.8	—37.91	16	12.50	8.90	+15 14.59 —0.437 15 38 59.43

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" " "	"	"			"	"	"	23° 26'	h m s
Oct.	1	274 187 29 58.3	147.59	-0.58	0.000 4101	-51.1	37.60	+16.40	20.44	57.95	11 20 30.26
	2	275 188 29 1.6	147.68	0.61	0.000 2872	51.3	37.74	16.36	20.45	57.94	11 16 34.35
	3	276 189 28 7.0	147.77	0.61	0.000 1637	51.6	37.88	16.31	20.46	57.92	11 12 38.45
	4	277 190 27 14.6	147.86	0.58	0.000 0394	51.9	38.02	16.27	20.46	57.90	11 8 42.54
	5	278 191 26 24.3	147.94	0.53	9.999 9146	52.1	38.15	16.22	20.47	57.89	11 4 46.63
	6	279 192 25 35.9	148.03	-0.46	9.999 7892	-52.4	38.29	+16.18	20.47	57.87	11 0 50.72
	7	280 193 24 49.6	148.11	0.37	9.999 6633	52.5	38.43	16.13	20.48	57.85	10 56 54.82
	8	281 194 24 5.1	148.19	0.25	9.999 5370	52.7	38.57	16.09	20.49	57.83	10 52 58.91
	9	282 195 23 22.6	148.27	-0.13	9.999 4103	52.9	38.70	16.05	20.49	57.82	10 49 3.00
	10	283 196 22 41.9	148.34	0.00	9.999 2833	53.0	38.84	16.01	20.50	57.80	10 45 7.10
	11	284 197 22 3.1	148.42	+0.12	9.999 1561	-53.0	38.98	+15.97	20.50	57.78	10 41 11.19
	12	285 198 21 26.0	148.49	0.23	9.999 0289	53.0	39.12	15.93	20.51	57.76	10 37 15.28
	13	286 199 20 50.7	148.56	0.33	9.998 9019	52.9	39.25	15.89	20.52	57.74	10 33 19.38
	14	287 200 20 17.1	148.64	0.42	9.998 7751	52.7	39.39	15.85	20.52	57.71	10 29 23.47
	15	288 201 19 45.2	148.71	0.48	9.998 6488	52.5	39.53	15.82	20.53	57.69	10 25 27.56
	16	289 202 19 15.2	148.79	+0.51	9.998 5231	-52.2	39.67	+15.78	20.53	57.67	10 21 31.65
	17	290 203 18 46.9	148.86	0.51	9.998 3982	51.8	39.81	15.75	20.54	57.64	10 17 35.75
	18	291 204 18 20.4	148.94	0.48	9.998 2744	51.4	39.94	15.71	20.55	57.62	10 13 39.84
	19	292 205 17 55.8	149.02	0.41	9.998 1516	50.9	40.08	15.68	20.55	57.60	10 9 43.93
	20	293 206 17 33.2	149.10	0.31	9.998 0299	50.4	40.22	15.65	20.56	57.57	10 5 48.02
	21	294 207 17 12.7	149.19	+0.18	9.997 9095	-49.9	40.36	+15.62	20.56	57.55	10 1 52.12
	22	295 208 16 54.3	149.28	+0.05	9.997 7903	49.4	40.49	15.59	20.57	57.52	9 57 56.21
	23	296 209 16 38.0	149.37	-0.08	9.997 6722	49.0	40.63	15.56	20.57	57.50	9 54 0.30
	24	297 210 16 24.0	149.46	0.22	9.997 5552	48.5	40.77	15.54	20.58	57.47	9 50 4.39
	25	298 211 16 12.2	149.56	0.34	9.997 4392	48.2	40.91	15.51	20.59	57.44	9 46 8.48
	26	299 212 16 2.7	149.65	-0.45	9.997 3240	-47.8	41.04	+15.49	20.59	57.42	9 42 12.58
	27	300 213 15 55.4	149.74	0.54	9.997 2096	47.5	41.18	15.47	20.60	57.39	9 38 16.67
	28	301 214 15 50.3	149.83	0.61	9.997 0958	47.3	41.32	15.45	20.60	57.36	9 34 20.76
	29	302 215 15 47.4	149.93	0.65	9.996 9826	47.0	41.46	15.43	20.61	57.33	9 30 24.85
	30	303 216 15 46.7	150.01	0.66	9.996 8701	46.8	41.59	15.41	20.61	57.31	9 26 28.94
	31	304 217 15 48.0	150.10	-0.64	9.996 7580	-46.6	41.73	+15.40	20.62	57.28	9 22 33.04
Nov.	1	305 218 15 51.4	150.18	0.60	9.996 6463	46.4	41.87	15.38	20.62	57.25	9 18 37.13
	2	306 219 15 56.7	150.26	0.53	9.996 5352	46.2	42.01	15.37	20.63	57.22	9 14 41.22
	3	307 220 16 4.0	150.34	0.44	9.996 4245	46.0	42.14	15.36	20.63	57.19	9 10 45.31
	4	308 221 16 13.2	150.42	0.33	9.996 3144	45.8	42.28	15.35	20.64	57.16	9 6 49.40
	5	309 222 16 24.1	150.49	-0.20	9.996 2047	-45.6	42.42	+15.34	20.64	57.13	9 2 53.49
	6	310 223 16 36.8	150.56	-0.07	9.996 0956	45.3	42.56	15.33	20.65	57.11	8 58 57.58
	7	311 224 16 51.1	150.63	+0.05	9.995 9872	45.0	42.69	15.33	20.65	57.08	8 55 1.67
	8	312 225 17 7.0	150.69	0.17	9.995 8795	44.7	42.83	15.33	20.66	57.05	8 51 5.76
	9	313 226 17 24.4	150.76	0.28	9.995 7726	44.3	42.97	15.32	20.66	57.02	8 47 9.86
	10	314 227 17 43.4	150.82	+0.37	9.995 6667	-43.9	43.11	+15.32	20.67	56.99	8 43 13.95
	11	315 228 18 3.7	150.88	0.44	9.995 5619	43.4	43.24	15.33	20.67	56.96	8 39 18.04
	12	316 229 18 25.4	150.93	0.48	9.995 4583	42.9	43.38	15.33	20.68	56.93	8 35 22.13
	13	317 230 18 48.5	150.99	0.49	9.995 3562	42.2	43.52	15.33	20.68	56.90	8 31 26.22
	14	318 231 19 13.0	151.05	0.46	9.995 2558	41.5	43.66	15.34	20.69	56.87	8 27 30.31
	15	319 232 19 38.8	151.10	+0.40	9.995 1571	-40.7	43.79	+15.35	20.69	56.84	8 23 34.40
	16	320 233 20 6.0	151.16	+0.31	9.995 0604	-39.9	43.93	+15.36	20.70	56.82	8 19 38.49

FOR GREENWICH MEAN NOON.

Data.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Nov. 16	Sa	15 23 44.84	10.294	-18 36 46.8	-37.91	16 12.50	8.90	+15 14.59	-0.437	15 38 59.43
17	Su	15 27 52.31	10.329	18 51 46.7	37.08	16 12.71	8.90	15 3.68	0.472	15 42 55.99
18	Mo	15 32 0.61	10.363	19 6 26.4	36.23	16 12.91	8.90	14 51.93	0.507	15 46 52.55
19	Tu	15 36 9.75	10.398	19 20 45.7	35.37	16 13.12	8.91	14 39.36	0.541	15 50 49.10
20	We	15 40 19.71	10.432	19 34 44.1	34.49	16 13.31	8.91	14 25.95	0.576	15 54 45.66
21	Th	15 44 30.50	10.467	-19 48 21.3	-33.60	16 13.51	8.91	+14 11.72	-0.610	15 58 42.22
22	Fr	15 48 42.11	10.501	20 1 36.9	32.69	16 13.69	8.91	13 56.66	0.645	16 2 38.77
23	Sa	15 52 54.54	10.535	20 14 30.6	31.77	16 13.88	8.91	13 40.78	0.678	16 6 35.33
24	Su	15 57 7.78	10.568	20 27 2.0	30.83	16 14.06	8.91	13 24.10	0.711	16 10 31.89
25	Mo	16 1 21.81	10.601	20 39 10.6	29.88	16 14.23	8.92	13 6.63	0.744	16 14 28.44
26	Tu	16 5 36.62	10.633	-20 50 56.3	-28.92	16 14.40	8.92	+12 48.38	-0.776	16 18 25.00
27	We	16 9 52.19	10.665	21 2 18.7	27.94	16 14.57	8.92	12 29.36	0.808	16 22 21.56
28	Th	16 14 8.52	10.695	21 13 17.3	26.94	16 14.73	8.92	12 9.60	0.839	16 26 18.11
29	Fr	16 18 25.57	10.725	21 23 51.9	25.94	16 14.90	8.92	11 49.10	0.869	16 30 14.67
30	Sa	16 22 43.33	10.754	21 34 2.2	24.91	16 15.05	8.92	11 27.90	0.898	16 34 11.23
Dec. 1	Su	16 27 1.77	10.782	-21 43 47.8	-23.88	16 15.21	8.93	+11 6.01	-0.926	16 38 7.78
2	Mo	16 31 20.89	10.810	21 53 8.6	22.84	16 15.37	8.93	10 43.45	0.954	16 42 4.34
3	Tu	16 35 40.64	10.836	22 2 4.0	21.78	16 15.52	8.93	10 20.26	0.979	16 46 0.90
4	We	16 40 1.00	10.861	22 10 34.0	20.71	16 15.66	8.93	9 56.46	1.004	16 49 57.46
5	Th	16 44 21.95	10.885	22 18 38.3	19.64	16 15.81	8.93	9 32.07	1.028	16 53 54.01
6	Fr	16 48 43.46	10.907	-22 26 16.5	-18.54	16 15.95	8.93	+ 9 7.12	-1.051	16 57 50.57
7	Sa	16 53 5.49	10.928	22 33 28.4	17.45	16 16.08	8.93	8 41.64	1.072	17 1 47.13
8	Su	16 57 28.02	10.948	22 40 13.9	16.34	16 16.22	8.93	8 15.67	1.092	17 5 43.69
9	Mo	17 1 51.01	10.967	22 46 32.8	15.22	16 16.34	8.94	7 49.23	1.111	17 9 40.24
10	Tu	17 6 14.44	10.985	22 52 24.7	14.10	16 16.47	8.94	7 22.36	1.128	17 13 36.80
11	We	17 10 38.28	11.001	-22 57 49.6	-12.97	16 16.59	8.94	+ 6 55.08	-1.145	17 17 33.36
12	Th	17 15 2.49	11.016	23 2 47.2	11.83	16 16.70	8.94	6 27.42	1.160	17 21 29.92
13	Fr	17 19 27.05	11.030	23 7 17.4	10.69	16 16.81	8.94	5 59.42	1.173	17 25 26.48
14	Sa	17 23 51.92	11.042	23 11 20.1	9.54	16 16.92	8.94	5 31.11	1.186	17 29 23.03
15	Su	17 28 17.09	11.054	23 14 55.1	8.38	16 17.02	8.94	5 2.51	1.197	17 33 19.59
16	Mo	17 32 42.51	11.064	-23 18 2.3	-7.22	16 17.11	8.94	+ 4 33.64	-1.208	17 37 16.15
17	Tu	17 37 8.16	11.073	23 20 41.6	6.06	16 17.20	8.94	4 4.55	1.216	17 41 12.71
18	We	17 41 34.02	11.081	23 22 52.8	4.88	16 17.28	8.94	3 35.25	1.225	17 45 9.27
19	Th	17 46 0.05	11.088	23 24 36.0	3.71	16 17.35	8.94	3 5.77	1.231	17 49 5.82
20	Fr	17 50 26.24	11.094	23 25 51.1	2.54	16 17.42	8.95	2 36.14	1.237	17 53 2.38
21	Sa	17 54 52.54	11.098	-23 26 37.9	-1.36	16 17.48	8.95	+ 2 6.40	-1.241	17 56 58.94
22	Su	17 59 18.93	11.101	23 26 56.4	-0.18	16 17.54	8.95	1 36.57	1.244	18 0 55.50
23	Mo	18 3 45.37	11.102	23 26 46.6	+1.00	16 17.59	8.95	1 6.68	1.246	18 4 52.06
24	Tu	18 8 11.84	11.102	23 26 8.6	2.18	16 17.63	8.95	0 36.78	1.246	18 8 48.61
25	We	18 12 38.29	11.101	23 25 2.2	3.35	16 17.67	8.95	+ 0 6.88	1.245	18 12 45.17
26	Th	18 17 4.69	11.099	-23 23 27.6	+4.53	16 17.71	8.95	- 0 22.97	-1.242	18 16 41.73
27	Fr	18 21 31.02	11.094	23 21 24.7	5.71	16 17.74	8.95	0 52.73	1.238	18 20 38.29
28	Sa	18 25 57.22	11.089	23 18 53.6	6.88	16 17.76	8.95	1 22.38	1.232	18 24 34.85
29	Su	18 30 23.27	11.082	23 15 54.4	8.05	16 17.78	8.95	1 51.87	1.225	18 28 31.40
30	Mo	18 34 49.14	11.073	23 12 27.2	9.21	16 17.80	8.95	2 21.18	1.217	18 32 27.96
31	Tu	18 39 14.78	11.063	-23 8 32.1	+10.38	16 17.81	8.95	- 2 50.27	-1.206	18 36 24.52
32	We	18 43 40.17	11.052	-23 4 9.2	+11.53	16 17.82	8.95	- 3 19.09	-1.195	18 40 21.08

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 26' "	h m s
Nov. 16	320	233 20 6.0	151.16	+0.31	9.995 0604	-39.9	43.93	+15.36	20.70	56.82	8 19 38.49
17	321	234 20 34.6	151.22	0.20	9.994 9658	39.0	44.07	15.37	20.70	56.79	8 15 42.58
18	322	235 21 4.8	151.29	+0.07	9.994 8734	38.1	44.21	15.38	20.71	56.76	8 11 46.67
19	323	236 21 36.4	151.36	-0.07	9.994 7831	37.2	44.35	15.39	20.71	56.73	8 7 50.76
20	324	237 22 9.7	151.42	0.21	9.994 6950	36.2	44.48	15.41	20.72	56.70	8 3 54.85
21	325	238 22 44.6	151.46	-0.34	9.994 6092	-35.3	44.62	+15.43	20.72	56.68	7 59 58.94
22	326	239 23 21.2	151.56	0.46	9.994 5254	34.5	44.76	15.45	20.72	56.65	7 56 3.03
23	327	240 23 59.4	151.63	0.56	9.994 4435	33.7	44.90	15.47	20.73	56.62	7 52 7.11
24	328	241 24 39.3	151.70	0.63	9.994 3636	32.9	45.03	15.49	20.73	56.59	7 48 11.20
25	329	242 25 20.9	151.77	0.68	9.994 2855	32.2	45.17	15.51	20.74	56.57	7 44 15.29
26	330	243 26 4.1	151.83	-0.70	9.994 2091	-31.5	45.31	+15.53	20.74	56.54	7 40 19.38
27	331	244 26 48.9	151.90	0.69	9.994 1343	30.9	45.45	15.56	20.74	56.51	7 36 23.47
28	332	245 27 35.2	151.96	0.64	9.994 0610	30.2	45.58	15.59	20.75	56.48	7 32 27.56
29	333	246 28 23.0	152.02	0.57	9.993 9892	29.6	45.72	15.61	20.75	56.46	7 28 31.65
30	334	247 29 12.1	152.08	0.48	9.993 9190	29.0	45.86	15.64	20.75	56.44	7 24 35.74
Dec. 1	335	248 30 2.7	152.13	-0.38	9.993 8501	-28.4	46.00	+15.67	20.76	56.42	7 20 39.83
2	336	249 30 54.5	152.18	0.26	9.993 7825	27.9	46.13	15.70	20.76	56.40	7 16 43.92
3	337	250 31 47.5	152.23	-0.13	9.993 7164	27.3	46.27	15.74	20.76	56.38	7 12 48.00
4	338	251 32 41.7	152.28	0.00	9.993 6515	26.7	46.41	15.77	20.77	56.35	7 8 52.09
5	339	252 33 36.8	152.32	+0.13	9.993 5881	26.1	46.55	15.80	20.77	56.33	7 4 56.18
6	340	253 34 32.9	152.36	+0.25	9.993 5260	-25.6	46.68	+15.84	20.77	56.31	7 1 0.27
7	341	254 35 29.3	152.39	0.35	9.993 4654	24.9	46.82	15.88	20.77	56.29	6 57 4.36
8	342	255 36 27.6	152.42	0.43	9.993 4064	24.2	46.96	15.91	20.78	56.27	6 53 8.45
9	343	256 37 26.0	152.45	0.48	9.993 3491	23.5	47.10	15.95	20.78	56.25	6 49 12.53
10	344	257 38 25.0	152.47	0.50	9.993 2936	22.7	47.23	15.99	20.78	56.23	6 45 16.62
11	345	258 39 24.6	152.49	+0.49	9.993 2400	-21.9	47.37	+16.03	20.79	56.22	6 41 20.71
12	346	259 40 24.7	152.51	0.44	9.993 1886	20.9	47.51	16.07	20.79	56.20	6 37 24.80
13	347	260 41 25.3	152.54	0.36	9.993 1395	20.0	47.65	16.11	20.79	56.18	6 33 28.89
14	348	261 42 26.4	152.56	0.26	9.993 0928	18.9	47.78	16.15	20.79	56.17	6 29 32.97
15	349	262 43 28.0	152.58	+0.13	9.993 0488	17.8	47.92	16.19	20.79	56.15	6 25 37.06
16	350	263 44 30.1	152.60	-0.01	9.993 0074	-16.6	48.06	+16.24	20.80	56.14	6 21 41.15
17	351	264 45 32.7	152.62	0.15	9.992 9689	15.5	48.20	16.28	20.80	56.12	6 17 45.24
18	352	265 46 36.0	152.65	0.29	9.992 9331	14.3	48.33	16.32	20.80	56.11	6 13 49.33
19	353	266 47 39.9	152.67	0.42	9.992 9002	13.1	48.47	16.36	20.80	56.10	6 9 53.41
20	354	267 48 44.4	152.70	0.52	9.992 8701	12.0	48.61	16.41	20.80	56.09	6 5 57.50
21	355	268 49 49.7	152.73	-0.60	9.992 8426	-10.9	48.75	+16.45	20.80	56.07	6 2 1.59
22	356	269 50 55.6	152.76	0.65	9.992 8178	9.8	48.89	16.49	20.81	56.06	5 58 5.68
23	357	270 52 2.3	152.79	0.68	9.992 7955	8.8	49.02	16.54	20.81	56.05	5 54 9.77
24	358	271 53 9.6	152.82	0.68	9.992 7756	7.8	49.16	16.58	20.81	56.05	5 50 13.85
25	359	272 54 17.5	152.84	0.64	9.992 7580	6.9	49.30	16.63	20.81	56.04	5 46 17.94
26	360	273 55 26.0	152.87	-0.58	9.992 7426	-6.0	49.44	+16.67	20.81	56.03	5 42 22.03
27	361	274 56 35.1	152.89	0.51	9.992 7293	5.1	49.57	16.71	20.81	56.03	5 38 26.12
28	362	275 57 44.6	152.91	0.41	9.992 7180	4.3	49.71	16.75	20.81	56.02	5 34 30.21
29	363	276 58 54.6	152.92	0.29	9.992 7088	3.5	49.85	16.79	20.81	56.01	5 30 34.29
30	364	278 0 4.9	152.94	0.17	9.992 7013	2.7	49.99	16.84	20.81	56.01	5 26 38.38
31	365	279 1 15.6	152.95	-0.04	9.992 6957	-2.0	50.12	+16.88	20.81	56.00	5 22 42.47
32	366	280 2 26.4	152.95	+0.09	9.992 6918	-1.3	50.26	+16.92	20.81	56.00	5 18 46.56

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Z True Equinox.		Red. to Mean Eq'x of 1918.0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	No
Jan. 1	+0.175 6146	+0.184 2114	-831	-0.887 5389	-0.886 0710	-183	-0.384 9935	-0.384 3570	-
2	0.192 7942	0.201 3623	837	0.884 5343	0.882 9290	148	0.383 6906	0.382 9944	-
3	0.209 9149	0.218 4516	942	0.881 2551	0.879 5126	164	0.382 2683	0.381 5124	-
4	0.226 9717	0.235 4746	847	0.877 7016	0.875 8224	179	0.380 7268	0.379 9116	-
5	0.243 9596	0.252 4259	852	0.873 8750	0.871 8595	195	0.379 0668	0.378 1925	-
6	+0.260 8728	+0.269 2998	-856	-0.869 7761	-0.867 6249	-211	-0.377 2886	-0.376 3553	-1
7	0.277 7062	0.286 0913	860	0.865 4060	0.863 1195	227	0.375 3926	0.374 4005	1
8	0.294 4544	0.302 7948	863	0.860 7656	0.858 3444	243	0.373 3792	0.372 3287	1
9	0.311 1119	0.319 4050	866	0.855 8562	0.853 3010	260	0.371 2490	0.370 1403	1
10	0.327 6733	0.335 9162	869	0.850 6791	0.847 9907	277	0.369 0026	0.367 8361	1
11	+0.344 1331	+0.352 3232	-871	-0.845 2360	-0.842 4151	-294	-0.366 6409	-0.365 4169	-1
12	0.360 4858	0.368 6202	873	0.839 5283	0.836 5757	311	0.364 1643	0.362 8832	1
13	0.376 7258	0.384 8018	874	0.833 5576	0.830 4744	328	0.361 5737	0.360 2360	1
14	0.392 8477	0.400 8627	875	0.827 3265	0.824 1139	345	0.358 8702	0.357 4764	1
15	0.408 8462	0.416 7976	876	0.820 8870	0.817 4961	363	0.356 0548	0.354 6055	1
16	+0.424 7161	+0.432 6011	-876	-0.814 0915	-0.810 6234	-380	-0.353 1285	-0.351 6240	-1
17	0.440 4521	0.448 2684	876	0.807 0922	0.803 4984	398	0.350 0922	0.348 5332	1
18	0.456 0495	0.463 7948	875	0.799 8422	0.796 1239	416	0.346 9473	0.345 3345	1
19	0.471 5036	0.479 1754	874	0.792 3439	0.788 5025	434	0.343 6950	0.342 0290	1
20	0.486 8096	0.494 4057	872	0.784 6001	0.780 6370	452	0.340 3365	0.338 6176	2
21	+0.501 9631	+0.509 4814	-870	-0.776 6136	-0.772 5303	-470	-0.336 8726	-0.335 1016	-2
22	0.516 9599	0.524 3980	867	0.768 3873	0.764 1850	488	0.333 3048	0.331 4824	2
23	0.531 7954	0.539 1515	864	0.759 9239	0.755 6043	506	0.329 6344	0.327 7610	2
24	0.546 4657	0.553 7376	860	0.751 2264	0.746 7905	524	0.325 8623	0.323 9385	2
25	0.560 9666	0.568 1521	856	0.742 2971	0.737 7464	542	0.321 9897	0.320 0160	2
26	+0.575 2938	+0.582 3911	-852	-0.733 1389	-0.728 4749	-560	-0.318 0177	-0.315 9949	-2
27	0.589 4436	0.596 4507	847	0.723 7548	0.718 9790	579	0.313 9478	0.311 8765	2
28	0.603 4118	0.610 3265	841	0.714 1478	0.709 2614	597	0.309 7810	0.307 6615	2
29	0.617 1943	0.624 0145	835	0.704 3202	0.699 3246	615	0.305 5183	0.303 3515	2
30	0.630 7868	0.637 5107	829	0.694 2750	0.689 1719	633	0.301 1613	0.298 9477	2
31	+0.644 1857	+0.650 8112	-822	-0.684 0156	-0.678 8064	-651	-0.296 7110	-0.294 4514	-2
Feb. 1	0.657 3868	0.663 9119	815	0.673 5446	0.668 2307	669	0.292 1690	0.289 8640	2
2	0.670 3861	0.676 8087	807	0.662 8651	0.657 4481	686	0.287 5364	0.285 1865	3
3	0.683 1794	0.689 4976	799	0.651 9802	0.646 4618	704	0.282 8145	0.280 4205	3
4	0.695 7629	0.701 9749	790	0.640 8933	0.635 2751	721	0.278 0048	0.275 5675	3
5	+0.708 1329	+0.714 2364	-781	-0.629 6075	-0.623 8911	-739	-0.273 1088	-0.270 6289	-3
6	0.720 2850	0.726 2781	771	0.618 1262	0.612 3132	756	0.268 1279	0.265 6061	3
7	0.732 2153	0.738 0962	761	0.606 4527	0.600 5450	773	0.263 0636	0.260 5007	3
8	0.743 9202	0.749 6868	750	0.594 5907	0.588 5902	790	0.257 9175	0.255 3143	3
9	0.755 3955	0.761 0459	739	0.582 5440	0.576 4526	807	0.252 6913	0.250 0487	3
10	+0.766 6374	+0.772 1696	-727	-0.570 3164	-0.564 1361	-823	-0.247 3867	-0.244 7056	-3
11	0.777 6421	0.783 0545	715	0.557 9120	0.551 6447	840	0.242 0055	0.239 2867	3
12	0.788 4064	0.793 6972	703	0.545 3348	0.538 9827	856	0.236 5494	0.233 7940	3
13	0.798 9265	0.804 0939	690	0.532 5891	0.526 1546	872	0.231 0206	0.228 2295	3
14	0.809 1991	0.814 2418	677	0.519 6797	0.513 1650	887	0.225 4209	0.222 5951	3
15	+0.819 2215	+0.824 1379	-663	-0.506 6110	-0.500 0183	-903	-0.219 7522	-0.216 8926	-3
16	0.828 9908	0.833 7798	649	0.493 3874	0.486 7188	918	0.214 0165	0.211 1240	-3

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1918.0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Feb. 16	+0.828 9908	+0.833 7798	-649	-0.493 3874	-0.486 7188	- 918	-0.214 0165	-0.211 1240	-396
17	0.838 5045	0.843 1647	635	0.480 0132	0.473 2712	933	0.208 2155	0.205 2912	403
18	0.847 7600	0.852 2902	620	0.466 4932	0.459 6798	948	0.202 3514	0.199 3963	409
19	0.856 7551	0.861 1543	605	0.452 8315	0.445 9490	963	0.196 4261	0.193 4409	415
20	0.865 4875	0.869 7546	589	0.439 0327	0.432 0833	977	0.190 4411	0.187 4270	421
21	+0.873 9554	+0.878 0894	-573	-0.425 1012	-0.418 0869	- 991	-0.184 3987	-0.181 3564	-427
22	0.882 1564	0.886 1560	556	0.411 0410	0.403 9640	1005	0.178 3004	0.175 2309	433
23	0.890 0682	0.893 9527	539	0.396 8565	0.389 7190	1019	0.172 1481	0.169 0523	439
24	0.897 7494	0.901 4779	522	0.382 5520	0.375 3561	1032	0.165 9437	0.162 8225	445
25	0.905 1379	0.908 7292	505	0.368 1318	0.360 8795	1045	0.159 6890	0.156 5433	451
26	+0.912 2517	+0.915 7050	-487	-0.353 5999	-0.346 2934	-1057	-0.153 3857	-0.150 2164	-456
27	0.919 0889	0.922 4032	469	0.338 9607	0.331 6023	1069	0.147 0356	0.143 8437	461
28	0.925 6477	0.928 8221	450	0.324 2186	0.316 8102	1081	0.140 6409	0.137 4273	466
Mar. 1	0.931 9262	0.934 9598	431	0.309 3776	0.301 9214	1093	0.134 2031	0.130 9687	471
2	0.937 9228	0.940 8150	412	0.294 4422	0.286 9405	1104	0.127 7242	0.124 4700	476
3	+0.943 6361	+0.946 3858	-392	-0.279 4168	-0.271 8716	-1115	-0.121 2062	-0.117 9330	-481
4	0.949 0640	0.951 6704	372	0.264 3055	0.256 7191	1126	0.114 6507	0.111 3596	486
5	0.954 2048	0.956 6671	352	0.249 1130	0.241 4876	1136	0.108 0600	0.104 7520	491
6	0.959 0570	0.961 3744	332	0.233 8436	0.226 1816	1146	0.101 4359	0.098 1119	495
7	0.963 6191	0.965 7909	311	0.218 5020	0.210 8055	1156	0.094 7804	0.091 4415	500
8	+0.967 8896	+0.969 9150	-290	-0.203 0926	-0.195 3640	-1165	-0.088 0956	-0.084 7428	-504
9	0.971 8669	0.973 7452	269	0.187 6203	0.179 8621	1174	0.081 3835	0.078 0179	508
10	0.975 5496	0.977 2801	247	0.172 0899	0.164 3045	1183	0.074 6463	0.071 2690	512
11	0.978 9364	0.980 5185	226	0.156 5064	0.148 6963	1191	0.067 8862	0.064 4982	516
12	0.982 0262	0.983 4596	204	0.140 8748	0.133 0425	1199	0.061 1054	0.057 7080	519
13	+0.984 8184	+0.986 1025	-182	-0.125 2002	-0.117 3485	-1207	-0.054 3062	-0.050 9003	-523
14	0.987 3120	0.988 4467	160	0.109 4880	0.101 6194	1214	0.047 4907	0.044 0778	526
15	0.989 5068	0.990 4923	138	0.093 7433	0.085 8603	1221	0.040 6613	0.037 2421	529
16	0.991 4030	0.992 2389	115	0.077 9711	0.070 0764	1227	0.033 8202	0.030 3960	532
17	0.993 0000	0.993 6863	92	0.062 1767	0.054 2727	1233	0.026 9696	0.023 5414	535
18	+0.994 2979	+0.994 8349	- 69	-0.046 3650	-0.038 4542	-1239	-0.020 1116	-0.016 6805	-537
19	0.995 2973	0.995 6850	46	0.030 5409	0.022 6257	1244	0.013 2482	0.009 8151	540
20	0.995 9982	0.996 2370	- 22	-0.014 7091	-0.006 7918	-1249	-0.006 3814	-0.002 9474	-542
21	0.996 4014	0.996 4914	+ 2	+0.001 1257	+0.009 0428	1254	+0.000 4866	+0.003 9205	544
22	0.996 5070	0.996 4485	26	0.016 9588	0.024 8733	1258	0.007 3540	0.010 7868	546
23	+0.996 3158	+0.996 1089	+ 50	+0.032 7856	+0.040 6953	-1262	+0.014 2188	+0.017 6497	-548
24	0.995 8280	0.995 4731	74	0.048 6017	0.056 5043	1265	0.021 0791	0.024 5069	550
25	0.995 0443	0.994 5416	98	0.064 4026	0.072 2959	1268	0.027 9328	0.031 3567	551
26	0.993 9652	0.993 3152	122	0.080 1838	0.088 0656	1271	0.034 7782	0.038 1971	552
27	0.992 5916	0.991 7946	146	0.095 9409	0.103 8090	1273	0.041 6132	0.045 0263	553
28	+0.990 9241	+0.989 9803	+171	+0.111 6695	+0.119 5217	-1275	+0.048 4360	+0.051 8422	-554
29	0.988 9632	0.987 8730	195	0.127 3652	0.135 1993	1277	0.055 2446	0.058 6431	555
30	0.986 7098	0.985 4737	220	0.143 0236	0.150 8375	1278	0.062 0373	0.065 4270	555
31	0.984 1648	0.982 7830	245	0.158 6404	0.166 4319	1279	0.068 8119	0.072 1919	556
Apr. 1	0.981 3286	0.979 8017	270	0.174 2113	0.181 9782	1280	0.075 5667	0.078 9360	556
2	+0.978 2025	+0.976 5309	+295	+0.189 7319	+0.197 4719	-1280	+0.082 2997	+0.085 6574	-556
3	+0.974 7871	+0.972 9712	+320	+0.205 1977	+0.212 9087	-1280	+0.089 0090	+0.092 3542	-555

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1918.0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Apr. 1	+0.981 3286	+0.979 8017	+ 270	+0.174 2113	+0.181 9782	-1280	+0.075 5667	+0.078 9360	-556
2	0.978 2025	0.976 5309	295	0.189 7319	0.197 4719	1280	0.082 2997	0.085 6574	556
3	0.974 7871	0.972 9712	320	0.205 1977	0.212 9087	1280	0.089 0090	0.092 3542	555
4	0.971 0833	0.969 1235	345	0.220 6043	0.228 2840	1280	0.095 6927	0.099 0242	555
5	0.967 0920	0.964 9889	371	0.235 9472	0.243 5934	1279	0.102 3486	0.105 6655	554
6	+0.962 8144	+0.960 5685	+ 396	+0.251 2219	+0.258 8322	-1278	+0.108 9748	+0.112 2761	-553
7	0.958 2515	0.955 8636	421	0.266 4238	0.273 9960	1276	0.115 5693	0.118 8541	552
8	0.953 4049	0.950 8754	446	0.281 5483	0.289 0800	1274	0.122 1301	0.125 3971	551
9	0.948 2755	0.945 6053	472	0.296 5904	0.304 0790	1271	0.128 6549	0.131 9032	550
10	0.942 8650	0.940 0551	497	0.311 5453	0.318 9886	1268	0.135 1418	0.138 3704	548
11	+0.937 1758	+0.934 2272	+ 523	+0.326 4084	+0.333 8041	-1265	+0.141 5888	+0.144 7967	-546
12	0.931 2095	0.928 1281	548	0.341 1751	0.348 8208	1262	0.147 9937	0.151 1797	544
13	0.924 9683	0.921 7455	574	0.355 8406	0.363 1340	1258	0.154 3545	0.157 5178	542
14	0.918 4549	0.915 0968	600	0.370 4005	0.377 6394	1254	0.160 6694	0.163 8091	540
15	0.911 6715	0.908 1795	626	0.384 8503	0.392 0325	1249	0.166 9366	0.170 0518	537
16	+0.904 6210	+0.900 9965	+ 652	+0.399 1857	+0.406 3094	-1244	+0.173 1543	+0.176 2440	-534
17	0.897 3063	0.893 5506	677	0.413 4030	0.420 4661	1239	0.179 3206	0.182 3840	531
18	0.889 7298	0.885 8443	703	0.427 4981	0.434 4986	1233	0.185 4340	0.188 4702	528
19	0.881 8943	0.877 8802	728	0.441 4670	0.448 4029	1227	0.191 4928	0.194 5009	524
20	0.873 8022	0.869 6608	754	0.455 3060	0.462 1757	1220	0.197 4950	0.200 4747	520
21	+0.865 4564	+0.861 1894	+ 779	+0.469 0116	+0.475 8131	-1213	+0.203 4398	+0.206 3900	-516
22	0.856 8600	0.852 4686	804	0.482 5798	0.489 3114	1206	0.209 3251	0.212 2450	512
23	0.848 0155	0.843 5012	830	0.496 0074	0.502 6673	1198	0.215 1495	0.218 0384	507
24	0.838 9260	0.834 2900	855	0.509 2906	0.515 8769	1190	0.220 9114	0.223 7685	503
25	0.829 5938	0.824 8377	880	0.522 4259	0.528 9371	1182	0.226 6094	0.229 4339	498
26	+0.820 0221	+0.815 1472	+ 905	+0.535 4100	+0.541 8443	-1173	+0.232 2418	+0.235 0331	-493
27	0.810 2135	0.805 2213	931	0.548 2396	0.554 6954	1164	0.237 8074	0.240 5646	488
28	0.800 1709	0.795 0628	956	0.560 9112	0.567 1868	1155	0.243 3045	0.246 0268	483
29	0.789 8973	0.784 6747	981	0.573 4216	0.579 6152	1145	0.248 7315	0.251 4184	477
30	0.779 3954	0.774 0597	1006	0.585 7673	0.591 8774	1135	0.254 0873	0.256 7381	471
May 1	+0.768 6679	+0.763 2205	+1031	+0.597 9451	+0.603 9699	-1124	+0.259 3704	+0.261 9841	-465
2	0.757 7179	0.752 1605	1056	0.609 9514	0.615 8892	1113	0.264 5790	0.267 1549	459
3	0.746 5486	0.740 8824	1081	0.621 7829	0.627 6321	1101	0.269 7116	0.272 2490	453
4	0.735 1625	0.729 3892	1106	0.633 4364	0.639 1952	1089	0.274 7668	0.277 2649	446
5	0.723 5630	0.717 6843	1130	0.644 9082	0.650 5749	1077	0.279 7430	0.282 2011	439
6	+0.711 7534	+0.705 7709	+1155	+0.656 1948	+0.661 7675	-1064	+0.284 6388	+0.287 0560	-432
7	0.699 7371	0.693 6525	1179	0.667 2927	0.672 7699	1051	0.289 4526	0.291 8283	425
8	0.687 5175	0.681 3325	1203	0.678 1987	0.683 5787	1037	0.294 1829	0.296 5163	418
9	0.675 0981	0.668 8149	1227	0.688 9092	0.694 1900	1023	0.298 8282	0.301 1185	410
10	0.662 4834	0.656 1040	1251	0.699 4208	0.704 6010	1009	0.303 3871	0.305 6337	402
11	+0.649 6773	+0.643 2037	+1275	+0.709 7302	+0.714 8082	- 994	+0.307 8582	+0.310 0605	-394
12	0.636 6837	0.630 1180	1299	0.719 8345	0.724 8088	979	0.312 2403	0.314 3976	386
13	0.623 5071	0.616 8515	1322	0.729 7307	0.734 5999	964	0.316 5321	0.318 6438	377
14	0.610 1518	0.603 4085	1345	0.739 4161	0.744 1791	948	0.320 7325	0.322 7981	369
15	0.596 6222	0.589 7933	1368	0.748 8884	0.753 5438	932	0.324 8405	0.326 8595	360
16	+0.582 9224	+0.576 0101	+1391	+0.758 1450	+0.762 6916	- 916	+0.328 8550	+0.330 8269	-351
17	+0.569 0569	+0.562 0632	+1413	+0.767 1833	+0.771 6200	- 899	+0.332 7750	+0.334 6993	-342

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1918.0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
May 17	+0.569 0569	+0.562 0632	+1413	+0.767 1833	+0.771 6200	-899	+0.332 7750	+0.334 6993	-342
18	0.555 0297	0.547 9569	1436	0.776 0014	0.780 3271	882	0.336 5996	0.338 4758	333
19	0.540 8453	0.533 6955	1458	0.784 5970	0.788 8109	864	0.340 3278	0.342 1555	324
20	0.526 5080	0.519 2832	1480	0.792 9685	0.797 0694	846	0.343 9589	0.345 7377	314
21	0.512 0217	0.504 7241	1502	0.801 1134	0.805 1003	827	0.347 4919	0.349 2213	304
22	+0.497 3909	+0.490 0225	+1523	+0.809 0298	+0.812 9016	-808	+0.350 9259	+0.352 6055	-294
23	0.482 6194	0.475 1824	1544	0.816 7157	0.820 4719	789	0.354 2601	0.355 8897	284
24	0.467 7118	0.460 2083	1565	0.824 1700	0.827 8095	769	0.357 4940	0.359 0729	274
25	0.452 6722	0.445 1040	1586	0.831 3904	0.834 9124	749	0.360 6264	0.362 1544	263
26	0.437 5043	0.429 8737	1606	0.838 3753	0.841 7789	728	0.363 6568	0.365 1335	253
27	+0.422 2127	+0.414 5217	+1626	+0.845 1230	+0.848 4075	-707	+0.366 5844	+0.368 0094	-242
28	0.406 8011	0.399 0515	1646	0.851 6320	0.854 7963	686	0.369 4084	0.370 7812	231
29	0.391 2735	0.383 4676	1666	0.857 9002	0.860 9436	664	0.372 1278	0.373 4481	220
30	0.375 6342	0.367 7740	1685	0.863 9262	0.866 8478	642	0.374 7420	0.376 0095	209
31	0.359 8874	0.351 9749	1704	0.869 7082	0.872 5072	619	0.377 2505	0.378 4648	198
June 1	+0.344 0370	+0.336 0744	+1723	+0.875 2446	+0.877 9201	-596	+0.379 6522	+0.380 8128	-187
2	0.328 0875	0.320 0770	1741	0.880 5335	0.883 0846	573	0.381 9464	0.383 0529	175
3	0.312 0434	0.303 9871	1759	0.885 5731	0.887 9989	549	0.384 1322	0.385 1843	163
4	0.295 9089	0.287 8094	1776	0.890 3617	0.892 6614	525	0.386 2091	0.387 2065	151
5	0.279 6890	0.271 5483	1793	0.894 8978	0.897 0706	500	0.388 1763	0.389 1185	139
6	+0.263 3881	+0.255 2090	+1809	+0.899 1796	+0.901 2248	-475	+0.390 0330	+0.390 9198	-127
7	0.247 0116	0.238 7964	1825	0.903 2061	0.905 1230	450	0.391 7788	0.392 6099	115
8	0.230 5640	0.222 3152	1841	0.906 9755	0.908 7635	424	0.393 4130	0.394 1881	102
9	0.214 0507	0.205 7710	1856	0.910 4869	0.912 1454	398	0.394 9352	0.395 6542	90
10	0.197 4767	0.189 1685	1871	0.913 7391	0.915 2679	371	0.396 3451	0.397 0079	77
11	+0.180 8471	+0.172 5130	+1886	+0.916 7317	+0.918 1303	-344	+0.397 6424	+0.398 2488	-64
12	0.164 1670	0.155 8096	1900	0.919 4636	0.920 7317	317	0.398 8269	0.399 3767	51
13	0.147 4415	0.139 0633	1913	0.921 9346	0.923 0721	290	0.399 8981	0.400 3913	38
14	0.130 6755	0.122 2788	1926	0.924 1442	0.925 1509	262	0.400 8561	0.401 2926	25
15	0.113 8739	0.105 4613	1939	0.926 0921	0.926 9679	234	0.401 7008	0.402 0806	-12
16	+0.097 0416	+0.088 6154	+1951	+0.927 7781	+0.928 5228	-205	+0.402 4320	+0.402 7550	+1
17	0.080 1833	0.071 7459	1963	0.929 2020	0.929 8158	176	0.403 0497	0.403 3160	14
18	0.063 3039	0.054 8578	1974	0.930 3640	0.930 8467	147	0.403 5538	0.403 7633	28
19	0.046 4081	0.037 9555	1985	0.931 2638	0.931 6153	117	0.403 9444	0.404 0971	41
20	0.029 5005	0.021 0437	1995	0.931 9013	0.932 1220	87	0.404 2214	0.404 3174	55
21	+0.012 5857	+0.004 1271	+2004	+0.932 2772	+0.932 3670	-57	+0.404 3850	+0.404 4242	+68
22	-0.004 3317	-0.012 7900	2013	0.932 3914	0.932 3503	-27	0.404 4351	0.404 4177	82
23	0.021 2473	0.029 7030	2021	0.932 2439	0.932 0723	+4	0.404 3719	0.404 2978	96
24	0.038 1565	0.046 6074	2029	0.931 8354	0.931 5332	35	0.404 1953	0.404 0646	110
25	0.055 0552	0.063 4992	2036	0.931 1658	0.930 7331	66	0.403 9055	0.403 7181	124
26	-0.071 9388	-0.080 3736	+2043	+0.930 2351	+0.929 6720	+98	+0.403 5024	+0.403 2584	+138
27	0.088 8029	0.097 2263	2049	0.929 0438	0.928 3505	130	0.402 9861	0.402 6856	152
28	0.105 6433	0.114 0532	2054	0.927 5920	0.926 7685	162	0.402 3568	0.401 9997	166
29	0.122 4554	0.130 8494	2059	0.925 8799	0.924 9262	194	0.401 6143	0.401 2007	180
30	0.139 2347	0.147 6106	2063	0.923 9074	0.922 8236	227	0.400 7588	0.400 2887	194
July 1	-0.155 9765	-0.164 3319	+2066	+0.921 6748	+0.920 4612	+259	+0.399 7903	+0.399 2638	+208
2	-0.172 6761	-0.181 0086	+2069	+0.919 1829	+0.917 8396	+292	+0.398 7090	+0.398 1260	+222

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1918.0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
July 1	-0.155 9765	-0.164 3319	+2066	+0.921 6748	+0.920 4612	+ 259	+0.399 7903	+0.399 2638	+208
2	0.172 6761	0.181 0086	2069	0.919 1829	0.917 8396	292	0.398 7090	0.398 1260	222
3	0.189 3288	0.197 6359	2071	0.916 4314	0.914 9583	325	0.397 5149	0.396 8757	236
4	0.205 9294	0.214 2087	2073	0.913 4206	0.911 8183	358	0.396 2084	0.395 5131	250
5	0.222 4731	0.230 7221	2074	0.910 1516	0.908 4205	391	0.394 7897	0.394 0384	264
6	-0.238 9549	-0.247 1710	+2074	+0.906 6250	+0.904 7652	+ 425	+0.393 2592	+0.392 4522	+279
7	0.255 3697	0.263 5504	2073	0.902 8414	0.900 8537	459	0.391 6174	0.390 7548	294
8	0.271 7125	0.279 8553	2072	0.898 8022	0.896 6870	493	0.389 8646	0.388 9468	308
9	0.287 9783	0.296 0807	2070	0.894 5082	0.892 2662	527	0.388 0014	0.387 0286	322
10	0.304 1620	0.312 2216	2067	0.889 9610	0.887 5929	561	0.386 0285	0.385 0011	336
11	-0.320 2590	-0.328 2735	+2064	+0.885 1621	+0.882 6688	+ 595	+0.383 9465	+0.382 8648	+351
12	0.336 2645	0.344 2316	2060	0.880 1131	0.877 4954	629	0.381 7562	0.380 6207	365
13	0.352 1740	0.360 0912	2055	0.874 8157	0.872 0743	663	0.379 4583	0.378 2692	379
14	0.367 9827	0.375 8479	2050	0.869 2715	0.866 4074	697	0.377 0534	0.375 8111	393
15	0.383 6863	0.391 4973	2044	0.863 4823	0.860 4964	731	0.374 5425	0.373 2475	407
16	-0.399 2803	-0.407 0349	+2037	+0.857 4500	+0.854 3434	+ 765	+0.371 9263	+0.370 5790	+421
17	0.414 7605	0.422 4566	2029	0.851 1767	0.847 9502	799	0.369 2057	0.367 8064	435
18	0.430 1226	0.437 7580	2021	0.844 6641	0.841 3186	834	0.366 3813	0.364 9306	449
19	0.445 3622	0.452 9349	2012	0.837 9142	0.834 4511	869	0.363 4542	0.361 9523	463
20	0.460 4755	0.467 9835	2002	0.830 9295	0.827 3496	903	0.360 4251	0.358 8727	477
21	-0.475 4585	-0.482 8999	+1991	+0.823 7118	+0.820 0162	+ 937	+0.357 2951	+0.355 6924	+491
22	0.490 3072	0.497 6801	1980	0.816 2630	0.812 4526	971	0.354 0648	0.352 4124	504
23	0.505 0180	0.512 3204	1968	0.808 5853	0.804 6614	1005	0.350 7352	0.349 0335	518
24	0.519 5868	0.526 8168	1955	0.800 6811	0.796 6446	1039	0.347 3073	0.345 5567	531
25	0.534 0100	0.541 1659	1942	0.792 5521	0.788 4038	1073	0.343 7817	0.341 9825	545
26	-0.548 2839	-0.555 3636	+1928	+0.784 2000	+0.779 9410	+1106	+0.340 1591	+0.338 3118	+558
27	0.562 4045	0.569 4061	1913	0.776 6270	0.771 2581	1139	0.336 4406	0.334 5456	572
28	0.576 3679	0.583 2894	1897	0.766 8347	0.762 3573	1172	0.332 6269	0.330 6847	585
29	0.590 1701	0.597 0095	1881	0.757 8260	0.753 2409	1205	0.328 7190	0.326 7300	598
30	0.603 8071	0.610 5623	1864	0.748 6024	0.743 9107	1238	0.324 7177	0.322 6823	611
31	-0.617 2746	-0.623 9436	+1846	+0.739 1661	+0.734 3688	+1271	+0.320 6240	+0.318 5428	+624
Aug. 1	0.630 5686	0.637 1491	1827	0.729 5193	0.724 6178	1303	0.316 4390	0.314 3126	637
2	0.643 6847	0.650 1749	1808	0.719 6647	0.714 6603	1336	0.312 1638	0.309 9927	650
3	0.656 6190	0.663 0166	1788	0.709 6049	0.704 4987	1368	0.307 7995	0.305 5843	662
4	0.669 3672	0.675 6703	1767	0.699 3423	0.694 1360	1400	0.303 3473	0.301 0887	675
5	-0.681 9253	-0.688 1319	+1746	+0.688 8802	+0.683 5751	+1431	+0.298 8087	+0.296 5073	+687
6	0.694 2894	0.700 3973	1724	0.678 2212	0.672 8189	1462	0.294 1847	0.291 8412	699
7	0.706 4553	0.712 4629	1701	0.667 3686	0.661 8708	1493	0.289 4769	0.287 0920	711
8	0.718 4196	0.724 3249	1677	0.656 3258	0.650 7341	1523	0.284 6867	0.282 2611	723
9	0.730 1784	0.735 9797	1653	0.645 0961	0.639 4121	1553	0.279 8155	0.277 3500	734
10	-0.741 7284	-0.747 4240	+1628	+0.633 6826	+0.627 9081	+1583	+0.274 8648	+0.272 3601	+746
11	0.753 0661	0.758 6542	1603	0.622 0889	0.616 2256	1612	0.269 8361	0.267 2930	757
12	0.764 1881	0.769 6673	1577	0.610 3186	0.604 3683	1641	0.264 7309	0.262 1501	768
13	0.775 0915	0.780 4602	1550	0.598 3751	0.592 3395	1669	0.259 5507	0.256 9330	779
14	0.785 7730	0.791 0296	1523	0.586 2620	0.580 1430	1697	0.254 2971	0.251 6432	790
15	-0.796 2296	-0.801 3727	+1495	+0.573 9829	+0.567 7822	+1725	+0.248 9715	+0.246 2822	+801
16	-0.806 4585	-0.811 4866	+1466	+0.561 5414	+0.555 2609	+1753	+0.243 5754	+0.240 8515	+812

SUN, 1918.

23

GREENWICH MEAN TIME.

Date.	X		Reduce. to Mean Eq'x of 1918.0.	Y		Reduce. to Mean Eq'x of 1918.0.	Z		Reduce. to Mean Eq'x of 1918.0.
	True Equinox.			True Equinox.			True Equinox.		
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Aug. 16	-0.806 4585	-0.811 4866	+1466	+0.561 5414	+0.555 2609	+1753	+0.243 5754	+0.240 8515	+ 812
17	0.816 4567	0.821 3686	1437	0.548 9411	0.542 5826	1780	0.238 1106	0.235 3529	822
18	0.826 2219	0.831 0162	1407	0.536 1857	0.529 7509	1807	0.232 5785	0.229 7877	832
19	0.835 7512	0.840 4267	1376	0.523 2787	0.516 7695	1833	0.226 9806	0.224 1574	842
20	0.845 0424	0.849 5980	1345	0.510 2238	0.503 6420	1859	0.221 3184	0.218 4637	852
21	-0.854 0931	-0.858 5275	+1313	+0.497 0245	+0.490 3718	+1884	+0.215 5935	+0.212 7079	+ 861
22	0.862 9008	0.867 2128	1281	0.483 6842	0.476 9622	1908	0.209 8072	0.206 8915	870
23	0.871 4633	0.875 6519	1248	0.470 2062	0.463 4167	1932	0.203 9611	0.201 0161	879
24	0.879 7782	0.883 8419	1215	0.456 5941	0.449 7387	1955	0.198 0566	0.195 0829	888
25	0.887 8426	0.891 7801	1181	0.442 8511	0.435 9317	1978	0.192 0952	0.189 0936	896
26	-0.895 6541	-0.899 4643	+1146	+0.428 9808	+0.421 9989	+2000	+0.186 0784	+0.183 0497	+ 905
27	0.903 2103	0.906 8917	1111	0.414 9864	0.407 9439	2022	0.180 0077	0.176 9526	913
28	0.910 5083	0.914 0597	1075	0.400 8717	0.393 7705	2043	0.173 8846	0.170 8040	921
29	0.917 5457	0.920 9659	1039	0.386 6407	0.379 4828	2064	0.167 7110	0.164 6059	928
30	0.924 3200	0.927 6076	1003	0.372 2972	0.365 0844	2084	0.161 4887	0.158 3597	936
31	-0.930 8285	-0.933 9822	+ 966	+0.357 8449	+0.350 5792	+2104	+0.155 2191	+0.152 0672	+ 943
Sept. 1	0.937 0685	0.940 0871	929	0.343 2880	0.335 9718	2123	0.148 9042	0.145 7304	950
2	0.943 0379	0.945 9206	891	0.328 6311	0.321 2664	2141	0.142 5460	0.139 3512	957
3	0.948 7348	0.951 4803	853	0.313 8782	0.306 4670	2159	0.136 1463	0.132 9314	964
4	0.954 1567	0.956 7639	814	0.299 0335	0.291 5783	2176	0.129 7070	0.126 4732	970
5	-0.959 3017	-0.961 7699	+ 775	+0.284 1020	+0.276 6050	+2192	+0.123 2301	+0.119 9781	+ 976
6	0.964 1682	0.966 4964	735	0.269 0879	0.261 5513	2208	0.116 7175	0.113 4484	982
7	0.968 7544	0.970 9420	695	0.253 9959	0.246 4221	2223	0.110 1712	0.106 8861	987
8	0.973 0590	0.975 1053	655	0.238 8305	0.231 2218	2238	0.103 5933	0.100 2930	992
9	0.977 0806	0.978 9847	614	0.223 5964	0.215 9550	2252	0.096 9856	0.093 6713	997
10	-0.980 8176	-0.982 5791	+ 573	+0.208 2982	+0.200 6265	+2265	+0.090 3503	+0.087 0228	+1001
11	0.984 2091	0.985 8874	532	0.192 9404	0.185 2406	2278	0.083 6892	0.080 3496	1005
12	0.987 4339	0.988 9086	490	0.177 5277	0.169 8021	2290	0.077 0044	0.073 6537	1009
13	0.990 3113	0.991 6420	448	0.162 0646	0.154 3157	2301	0.070 2978	0.066 9369	1013
14	0.992 9005	0.994 0869	406	0.146 5560	0.138 7860	2312	0.063 5713	0.060 2013	1016
15	-0.995 2010	-0.996 2427	+ 364	+0.131 0062	+0.123 2173	+2322	+0.056 8270	+0.053 4487	+1019
16	0.997 2120	0.998 1087	321	0.115 4198	0.107 6142	2331	0.050 0667	0.046 6812	1022
17	0.998 9330	0.999 6848	278	0.099 8011	0.091 9811	2339	0.043 2924	0.039 9005	1025
18	1.000 3641	1.000 9708	235	0.084 1546	0.076 3222	2347	0.036 5058	0.033 1085	1027
19	1.001 5048	1.001 9661	192	0.068 4845	0.060 6419	2354	0.029 7089	0.026 3071	1029
20	-1.002 3546	-1.002 6703	+ 148	+0.052 7950	+0.044 9443	+2361	+0.022 9033	+0.019 4979	+1030
21	1.002 9131	1.003 0830	104	0.037 0904	0.029 2336	2367	0.016 0910	0.012 6829	1031
22	1.003 1799	1.003 2039	60	0.021 3746	+0.013 5138	2372	0.009 2737	+0.005 8637	1032
23	1.003 1548	1.003 0325	+ 16	+0.005 6518	-0.002 2108	2376	+0.002 4531	-0.000 9577	1033
24	1.002 8369	1.002 5680	- 28	-0.010 0736	0.017 9360	2380	-0.004 3686	0.007 7794	1034
25	-1.002 2257	-1.001 8100	- 72	-0.025 7975	-0.033 6574	+2383	-0.011 1898	-0.014 5995	+1034
26	1.001 3209	1.000 7583	117	0.041 5152	0.049 3705	2385	0.018 0083	0.021 4159	1034
27	1.000 1222	0.999 4124	162	0.057 2225	0.065 0707	2387	0.024 8221	0.028 2267	1032
28	0.998 6290	0.997 7719	207	0.072 9144	0.080 7532	2388	0.031 6294	0.035 0298	1032
29	0.996 8412	0.995 8369	252	0.088 5863	0.096 4132	2388	0.038 4278	0.041 8230	1031
30	-0.994 7590	-0.993 6075	- 297	-0.104 2333	-0.112 0460	+2388	-0.045 2153	-0.048 6044	+1029
Oct. 1	-0.992 3825	-0.991 0839	- 342	-0.119 8507	-0.127 6467	+2387	-0.051 9899	-0.055 3716	+1027

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1918.0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Oct. 1	-0.992 3825	-0.991 0839	-342	-0.119 8507	-0.127 6467	+2387	-0.051 9899	-0.055 3716	+1027
2	0.989 7119	0.988 2664	387	0.135 4335	0.143 2103	2385	0.058 7493	0.062 1226	1024
3	0.986 7475	0.985 1553	432	0.150 9767	0.158 7320	2382	0.065 4913	0.068 8553	1021
4	0.983 4900	0.981 7515	477	0.166 4757	0.174 2070	2379	0.072 2141	0.075 5675	1018
5	0.979 9400	0.978 0556	522	0.181 9253	0.189 6301	2375	0.078 9153	0.082 2571	1015
6	-0.976 0984	-0.974 0685	-568	-0.197 3207	-0.204 9965	+2371	-0.085 5928	-0.088 9220	+1012
7	0.971 9662	0.969 7916	614	0.212 6570	0.220 3016	2365	0.092 2446	0.095 5602	1008
8	0.967 5449	0.965 2261	659	0.227 9296	0.235 5404	2359	0.098 8686	0.102 1696	1004
9	0.962 8353	0.960 3728	704	0.243 1334	0.250 7081	2352	0.105 4629	0.108 7481	999
10	0.957 8387	0.955 2333	749	0.258 2638	0.265 7999	2345	0.112 0251	0.115 2937	994
11	-0.952 5569	-0.949 8096	-794	-0.273 3159	-0.280 8112	+2337	-0.118 5535	-0.121 8043	+ 989
12	0.946 9916	0.944 1032	839	0.288 2852	0.295 7374	2328	0.125 0460	0.128 2782	983
13	0.941 1445	0.938 1158	884	0.303 1672	0.310 5740	2318	0.131 5007	0.134 7132	977
14	0.935 0173	0.931 8493	928	0.317 9574	0.325 3168	2308	0.137 9156	0.141 1076	971
15	0.928 6120	0.925 3058	972	0.332 6515	0.339 9611	2297	0.144 2890	0.147 4595	965
16	-0.921 9308	-0.918 4872	-1017	-0.347 2450	-0.354 5029	+2286	-0.150 6189	-0.153 7670	+ 958
17	0.914 9755	0.911 3959	1062	0.361 7341	0.368 9381	2274	0.156 9036	0.160 0285	951
18	0.907 7485	0.904 0337	1106	0.376 1145	0.383 2627	2261	0.163 1414	0.166 2422	943
19	0.900 2515	0.896 4022	1150	0.390 3823	0.397 4728	2247	0.169 3306	0.172 4063	935
20	0.892 4861	0.888 5035	1194	0.404 5337	0.411 5644	2233	0.175 4693	0.178 5193	927
21	-0.884 4547	-0.880 3399	-1238	-0.418 5644	-0.425 5335	+2218	-0.181 5560	-0.184 5793	+ 918
22	0.876 1592	0.871 9128	1282	0.432 4710	0.439 3764	2202	0.187 5888	0.190 5844	909
23	0.867 6010	0.863 2241	1325	0.446 2491	0.453 0887	2186	0.193 5658	0.196 5328	900
24	0.858 7824	0.854 2760	1368	0.459 8946	0.466 6663	2169	0.199 4853	0.202 4229	890
25	0.849 7053	0.845 0704	1411	0.473 4033	0.480 1050	2151	0.205 3454	0.208 2526	880
26	-0.840 3717	-0.835 6095	-1454	-0.486 7709	-0.493 4006	+2133	-0.211 1443	-0.214 0202	+ 870
27	0.830 7840	0.825 8955	1497	0.499 9934	0.506 5487	2114	0.216 8800	0.219 7236	860
28	0.820 9443	0.815 9309	1539	0.513 0659	0.519 5446	2094	0.222 5506	0.225 3609	849
29	0.810 8556	0.805 7187	1581	0.525 9842	0.532 3843	2074	0.228 1542	0.230 9303	838
30	0.800 5207	0.795 2617	1623	0.538 7444	0.545 0638	2053	0.233 6890	0.236 4300	826
31	-0.789 9421	-0.784 5624	-1665	-0.551 3420	-0.557 5785	+2031	-0.239 1531	-0.241 8581	+ 814
Nov. 1	0.779 1229	0.773 6241	1706	0.563 7728	0.569 9248	2009	0.244 5447	0.247 2128	802
2	0.768 0665	0.762 4502	1747	0.576 0326	0.582 0971	1986	0.249 8621	0.252 4924	790
3	0.756 7758	0.751 0438	1787	0.588 1173	0.594 0928	1962	0.255 1034	0.257 6950	777
4	0.745 2545	0.739 4083	1827	0.600 0229	0.605 9072	1938	0.260 2669	0.262 8189	764
5	-0.733 5058	-0.727 5474	-1867	-0.611 7452	-0.617 5365	+1913	-0.265 3508	-0.267 8624	+ 751
6	0.721 5335	0.715 4647	1907	0.623 2805	0.628 9769	1887	0.270 3536	0.272 8241	737
7	0.709 3413	0.703 1640	1946	0.634 6251	0.640 2247	1861	0.275 2737	0.277 7022	723
8	0.696 9334	0.690 6497	1985	0.645 7752	0.651 2762	1834	0.280 1094	0.282 4951	709
9	0.684 3134	0.677 9252	2023	0.656 7272	0.662 1278	1807	0.284 8592	0.287 2014	694
10	-0.671 4855	-0.664 9948	-2061	-0.667 4776	-0.672 7764	+1779	-0.289 5217	-0.291 8199	+ 679
11	0.658 4536	0.651 8624	2099	0.678 0235	0.683 2185	1750	0.294 0956	0.296 3487	664
12	0.645 2219	0.638 5326	2136	0.688 3611	0.693 4509	1720	0.298 5792	0.300 7869	649
13	0.631 7949	0.625 0074	2172	0.698 4876	0.703 4709	1690	0.302 9715	0.305 1330	633
14	0.618 1766	0.611 2969	2208	0.708 4004	0.713 2757	1659	0.307 2713	0.309 3861	617
15	-0.604 3708	-0.597 3990	-2244	-0.718 0965	-0.722 8623	+1628	-0.311 4772	-0.313 5446	+ 600
16	-0.590 3820	-0.583 3201	-2279	-0.727 5729	-0.732 2281	+1596	-0.315 5881	-0.317 6076	+ 584

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1918.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1918.0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Nov. 16	-0.590 3820	-0.583 3201	-2279	-0.727 5729	-0.732 2281	+1596	-0.315 5881	-0.317 6076	+584
17	0.576 2140	0.569 0642	2314	0.736 8275	0.741 3708	1563	0.319 6028	0.321 5737	567
18	0.561 8710	0.554 6349	2349	0.745 8575	0.750 2874	1530	0.323 5201	0.325 4418	551
19	0.547 3565	0.540 0369	2383	0.754 6601	0.758 9753	1496	0.327 3388	0.329 2109	534
20	0.532 6747	0.525 2723	2416	0.763 2327	0.767 4319	1462	0.331 0579	0.332 8797	517
21	-0.517 8295	-0.510 3468	-2449	-0.771 5727	-0.775 6547	+1427	-0.334 6761	-0.336 4469	+499
22	0.502 8248	0.495 2640	2481	0.779 6774	0.783 6406	1391	0.338 1919	0.339 9111	481
23	0.487 6649	0.480 0281	2513	0.787 5440	0.791 3871	1355	0.341 6045	0.343 2717	463
24	0.472 3541	0.464 6434	2544	0.795 1695	0.798 8910	1318	0.344 9125	0.346 5268	445
25	0.456 8967	0.449 1145	2574	0.802 5513	0.806 1500	1281	0.348 1145	0.349 6755	426
26	-0.441 2973	-0.433 4458	-2604	-0.809 6868	-0.813 1614	+1243	-0.351 2096	-0.352 7166	+407
27	0.425 5606	0.417 6421	2633	0.816 5734	0.819 9225	1204	0.354 1964	0.355 6489	387
28	0.409 6910	0.401 7080	2661	0.823 2084	0.826 4307	1165	0.357 0739	0.358 4714	368
29	0.393 6937	0.385 6488	2689	0.829 5893	0.832 6839	1125	0.359 8413	0.361 1834	348
30	0.377 5738	0.369 4693	2716	0.835 7141	0.838 6797	1084	0.362 4974	0.363 7834	329
Dec. 1	-0.361 3359	-0.353 1744	-2743	-0.841 5803	-0.844 4156	+1043	-0.365 0412	-0.366 2706	+309
2	0.344 9854	0.336 7696	2769	0.847 1855	0.849 8897	1001	0.367 4716	0.368 6442	289
3	0.328 5276	0.320 2600	2794	0.852 5279	0.855 1000	959	0.369 7882	0.370 9035	269
4	0.311 9675	0.303 6508	2818	0.857 6056	0.860 0445	917	0.371 9899	0.373 0474	249
5	0.295 3107	0.286 9478	2842	0.862 4166	0.864 7216	874	0.374 0760	0.375 0755	228
6	-0.278 5628	-0.270 1564	-2865	-0.866 9593	-0.869 1297	+ 831	-0.376 0457	-0.376 9867	+207
7	0.261 7292	0.253 2819	2887	0.871 2324	0.873 2674	787	0.377 8985	0.378 7809	186
8	0.244 8153	0.236 3300	2908	0.875 2344	0.877 1334	742	0.379 6338	0.380 4573	165
9	0.227 8266	0.219 3059	2929	0.878 9643	0.880 7269	697	0.381 2514	0.382 0158	144
10	0.210 7687	0.202 2156	2949	0.882 4209	0.884 0463	651	0.382 7505	0.383 4555	123
11	-0.193 6472	-0.185 0643	-2968	-0.885 6032	-0.887 0915	+ 605	-0.384 1308	-0.384 7764	+101
12	0.176 4674	0.167 8572	2986	0.888 5110	0.889 8615	558	0.385 3922	0.385 9781	80
13	0.159 2345	0.150 5999	3003	0.891 1431	0.892 3557	511	0.386 5342	0.387 0604	58
14	0.141 9540	0.133 2974	3019	0.893 4992	0.894 5737	464	0.387 5567	0.388 0230	36
15	0.124 6308	0.115 9548	3035	0.895 5791	0.896 5152	416	0.388 4594	0.388 8658	+ 14
16	-0.107 2700	-0.098 5771	-3049	-0.897 3821	-0.898 1797	+ 368	-0.389 2421	-0.389 5884	- 8
17	0.089 8767	0.081 1694	3063	0.898 9080	0.899 5668	319	0.389 9047	0.390 1908	30
18	0.072 4558	0.063 7365	3076	0.900 1561	0.900 6761	270	0.390 4467	0.390 6725	52
19	0.055 0122	0.046 2834	3088	0.901 1265	0.901 5071	221	0.390 8681	0.391 0335	74
20	0.037 5509	0.028 8153	3099	0.901 8180	0.902 0592	171	0.391 1686	0.391 2734	96
21	-0.020 0772	-0.011 3372	-3109	-0.902 2306	-0.902 3323	+ 121	-0.391 3479	-0.391 3921	-119
22	-0.002 5959	+0.006 1459	3118	0.902 3640	0.902 3257	71	0.391 4059	0.391 3893	141
23	+0.014 8876	0.023 6285	3126	0.902 2173	0.902 0389	+ 20	0.391 3424	0.391 2650	164
24	0.032 3679	0.041 1052	3133	0.901 7904	0.901 4719	- 31	0.391 1572	0.391 0189	186
25	0.049 8396	0.058 5705	3140	0.901 0834	0.900 6247	83	0.390 8503	0.390 6512	209
26	+0.067 2973	+0.076 0192	-3145	-0.900 0958	-0.899 4969	- 135	-0.390 4216	-0.390 1617	-231
27	0.084 7354	0.093 4454	3149	0.898 8280	0.898 0889	187	0.389 8713	0.389 5504	254
28	0.102 1484	0.110 8438	3152	0.897 2797	0.896 4006	239	0.389 1992	0.388 8176	276
29	0.119 5309	0.128 2088	3154	0.895 4515	0.894 4324	291	0.388 4056	0.387 9632	299
30	0.136 8770	0.145 5348	3155	0.893 3435	0.892 1847	344	0.387 4905	0.386 9876	322
31	+0.154 1813	+0.162 8159	-3155	-0.890 9562	-0.889 6580	- 396	-0.386 4544	-0.385 8910	-344
32	+0.171 4378	+0.180 0464	-3154	-0.888 2902	-0.886 8528	- 449	-0.385 2973	-0.384 6735	-367

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
JANUARY 1.									JANUARY 3.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	9	50	7.02	1.8648	+8	29	53.7	-11.558	0	11	17	26.21	1.7976	-1	3	6.5	-12.068
1	9	51	58.83	1.8620	8	18	19.4	11.585	1	11	19	14.07	1.7978	1	15	10.3	12.060
2	9	53	50.46	1.8592	8	6	43.5	11.611	2	11	21	1.94	1.7979	1	27	13.7	12.054
3	9	55	41.93	1.8565	7	55	6.1	11.636	3	11	22	49.82	1.7983	1	39	16.8	12.048
4	9	57	33.24	1.8538	7	43	27.2	11.660	4	11	24	37.73	1.7987	1	51	19.5	12.042
5	9	59	24.39	1.8513	7	31	46.9	11.684	5	11	26	25.66	1.7990	2	3	21.8	12.035
6	10	1	15.39	1.8487	7	20	5.1	11.708	6	11	28	13.61	1.7995	2	15	23.7	12.027
7	10	3	6.23	1.8462	7	8	22.0	11.729	7	11	30	1.60	1.8001	2	27	25.0	12.018
8	10	4	56.93	1.8438	6	56	37.6	11.751	8	11	31	49.62	1.8007	2	39	25.8	12.009
9	10	6	47.48	1.8413	6	44	51.9	11.772	9	11	33	37.68	1.8014	2	51	26.1	11.999
10	10	8	37.89	1.8391	6	33	5.0	11.792	10	11	35	25.79	1.8022	3	3	25.7	11.989
11	10	10	28.17	1.8368	6	21	16.9	11.811	11	11	37	13.94	1.8029	3	15	24.8	11.978
12	10	12	18.31	1.8346	6	9	27.7	11.829	12	11	39	2.14	1.8038	3	27	23.1	11.966
13	10	14	8.32	1.8325	5	57	37.4	11.848	13	11	40	50.40	1.8048	3	39	20.7	11.954
14	10	15	58.21	1.8305	5	45	46.0	11.865	14	11	42	38.71	1.8058	3	51	17.6	11.942
15	10	17	47.98	1.8284	5	33	53.6	11.881	15	11	44	27.09	1.8069	4	3	13.7	11.928
16	10	19	37.62	1.8264	5	22	0.3	11.897	16	11	46	15.54	1.8080	4	15	9.0	11.915
17	10	21	27.15	1.8246	5	10	6.0	11.913	17	11	48	4.05	1.8092	4	27	3.5	11.901
18	10	23	16.57	1.8228	4	58	10.8	11.928	18	11	49	52.64	1.8105	4	38	57.1	11.885
19	10	25	5.88	1.8210	4	46	14.7	11.941	19	11	51	41.31	1.8118	4	50	49.7	11.869
20	10	26	55.09	1.8193	4	34	17.9	11.953	20	11	53	30.06	1.8133	5	2	41.4	11.853
21	10	28	44.20	1.8177	4	22	20.3	11.967	21	11	55	18.90	1.8148	5	14	32.0	11.835
22	10	30	33.21	1.8161	4	10	21.9	11.978	22	11	57	7.83	1.8163	5	26	21.6	11.818
23	10	32	22.13	1.8146	+3	58	22.9	-11.989	23	11	58	56.85	1.8178	-5	38	10.2	-11.800
JANUARY 2.									JANUARY 4.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	10	34	10.96	1.8132	+3	46	23.2	-12.000	0	12	0	45.97	1.8195	-5	49	57.6	-11.781
1	10	35	59.71	1.8118	3	34	22.9	12.010	1	12	2	35.19	1.8213	6	1	43.9	11.762
2	10	37	48.37	1.8104	3	22	22.0	12.019	2	12	4	24.52	1.8232	6	13	29.0	11.742
3	10	39	36.96	1.8093	3	10	20.6	12.028	3	12	6	13.97	1.8250	6	25	12.9	11.721
4	10	41	25.48	1.8080	2	58	18.7	12.035	4	12	8	3.52	1.8268	6	36	55.5	11.699
5	10	43	13.92	1.8068	2	46	16.4	12.043	5	12	9	53.19	1.8289	6	48	36.8	11.678
6	10	45	2.30	1.8058	2	34	13.6	12.050	6	12	11	42.99	1.8310	7	0	16.8	11.655
7	10	46	50.61	1.8048	2	22	10.4	12.056	7	12	13	32.91	1.8331	7	11	55.4	11.632
8	10	48	38.87	1.8038	2	10	6.9	12.062	8	12	15	22.96	1.8353	7	23	32.6	11.608
9	10	50	27.07	1.8029	1	58	3.0	12.067	9	12	17	13.14	1.8374	7	35	8.3	11.583
10	10	52	15.22	1.8022	1	45	58.9	12.070	10	12	19	3.45	1.8398	7	46	42.6	11.558
11	10	54	3.33	1.8014	1	33	54.6	12.074	11	12	20	53.91	1.8423	7	58	15.3	11.532
12	10	55	51.39	1.8008	1	21	50.0	12.078	12	12	22	44.52	1.8448	8	9	46.4	11.505
13	10	57	39.42	1.8002	1	9	45.3	12.079	13	12	24	35.28	1.8472	8	21	15.9	11.478
14	10	59	27.41	1.7995	0	57	40.5	12.081	14	12	26	26.18	1.8498	8	32	43.8	11.451
15	11	1	15.36	1.7991	0	45	35.6	12.083	15	12	28	17.25	1.8525	8	44	10.0	11.423
16	11	3	3.30	1.7987	0	33	30.6	12.083	16	12	30	8.48	1.8552	8	55	34.5	11.393
17	11	4	51.20	1.7983	0	21	25.7	12.083	17	12	31	59.87	1.8579	9	6	57.1	11.363
18	11	6	39.09	1.7980	+0	9	20.7	12.083	18	12	33	51.43	1.8608	9	18	18.0	11.333
19	11	8	26.96	1.7978	-0	2	44.2	12.081	19	12	35	43.16	1.8636	9	29	37.0	11.301
20	11	10	14.82	1.7976	0	14	49.0	12.079	20	12	37	35.06	1.8666	9	40	54.1	11.269
21	11	12	2.67	1.7975	0	26	53.7	12.077	21	12	39	27.15	1.8697	9	52	9.3	11.237
22	11	13	50.52	1.7974	0	38	58.2	12.073	22	12	41	19.42	1.8728	10	3	22.5	11.203
23	11	15	38.36	1.7974	0	51	2.5	12.069	23	12	43	11.88	1.8759	10	14	33.6	11.168
24	11	17	26.21	1.7976	-1	3	6.5	-12.065	24	12	45	4.53	1.8792	-10	25	42.7	-11.134

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 5.					JANUARY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 45 4.53	1.8792	-10 25 42.7	-11.134	0	14 20 5.47	2.0998	-18 24 58.4	-8.498
1	12 46 57.38	1.8824	10 36 49.7	11.098	1	14 22 11.63	2.1055	18 33 25.9	8.419
2	12 48 50.42	1.8858	10 47 54.5	11.063	2	14 24 18.13	2.1112	18 41 48.7	8.340
3	12 50 43.67	1.8892	10 58 57.2	11.026	3	14 26 24.97	2.1169	18 50 6.7	8.260
4	12 52 37.12	1.8926	11 9 57.6	10.988	4	14 28 32.16	2.1228	18 58 19.9	8.179
5	12 54 30.78	1.8962	11 20 55.7	10.949	5	14 30 39.70	2.1286	19 6 28.2	8.098
6	12 56 24.66	1.8998	11 31 51.5	10.910	6	14 32 47.59	2.1345	19 14 31.6	8.014
7	12 58 18.75	1.9033	11 42 44.9	10.870	7	14 34 55.84	2.1403	19 22 29.9	7.929
8	13 0 13.06	1.9071	11 53 35.9	10.829	8	14 37 4.43	2.1462	19 30 23.1	7.844
9	13 2 7.60	1.9109	12 4 24.4	10.788	9	14 39 13.38	2.1522	19 38 11.2	7.758
10	13 4 2.37	1.9148	12 15 10.4	10.746	10	14 41 22.69	2.1581	19 45 54.1	7.671
11	13 5 57.37	1.9186	12 25 53.9	10.703	11	14 43 32.35	2.1640	19 53 31.7	7.582
12	13 7 52.60	1.9225	12 36 34.7	10.658	12	14 45 42.37	2.1700	20 1 3.9	7.492
13	13 9 48.07	1.9266	12 47 12.9	10.614	13	14 47 52.75	2.1760	20 8 30.7	7.401
14	13 11 43.79	1.9307	12 57 48.4	10.568	14	14 50 3.49	2.1819	20 15 52.0	7.309
15	13 13 39.75	1.9348	13 8 21.1	10.523	15	14 52 14.58	2.1879	20 23 7.8	7.216
16	13 15 35.96	1.9390	13 18 51.1	10.476	16	14 54 26.04	2.1940	20 30 17.9	7.122
17	13 17 32.43	1.9433	13 29 18.2	10.428	17	14 56 37.86	2.2000	20 37 22.4	7.027
18	13 19 29.15	1.9475	13 39 42.4	10.378	18	14 58 50.04	2.2060	20 44 21.1	6.930
19	13 21 26.13	1.9518	13 50 3.6	10.329	19	15 1 2.58	2.2120	20 51 14.0	6.833
20	13 23 23.37	1.9563	14 0 21.9	10.279	20	15 3 15.48	2.2180	20 58 1.0	6.733
21	13 25 20.88	1.9608	14 10 37.1	10.228	21	15 5 28.74	2.2241	21 4 42.0	6.633
22	13 27 18.66	1.9653	14 20 49.2	10.176	22	15 7 42.37	2.2301	21 11 17.0	6.533
23	13 29 16.71	1.9698	-14 30 58.2	-10.123	23	15 9 56.35	2.2361	-21 17 45.9	-6.431
JANUARY 6.					JANUARY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 31 15.04	1.9745	-14 41 3.9	-10.068	0	15 12 10.70	2.2422	-21 24 8.7	-6.328
1	13 33 13.65	1.9792	14 51 6.4	10.014	1	15 14 25.41	2.2482	21 30 25.2	6.223
2	13 35 12.54	1.9838	15 1 5.6	9.958	2	15 16 40.48	2.2541	21 36 35.4	6.118
3	13 37 11.71	1.9887	15 11 1.4	9.902	3	15 18 55.90	2.2601	21 42 39.3	6.011
4	13 39 11.18	1.9935	15 20 53.8	9.845	4	15 21 11.69	2.2662	21 48 36.7	5.903
5	13 41 10.93	1.9984	15 30 42.8	9.787	5	15 23 27.84	2.2721	21 54 27.6	5.793
6	13 43 10.99	2.0034	15 40 28.2	9.727	6	15 25 44.34	2.2780	22 0 11.9	5.683
7	13 45 11.34	2.0083	15 50 10.0	9.668	7	15 28 1.20	2.2839	22 5 49.6	5.572
8	13 47 11.99	2.0133	15 59 48.3	9.607	8	15 30 18.41	2.2898	22 11 20.5	5.459
9	13 49 12.94	2.0184	16 9 22.8	9.543	9	15 32 35.98	2.2958	22 16 44.7	5.347
10	13 51 14.20	2.0236	16 18 53.5	9.481	10	15 34 53.90	2.3016	22 22 2.1	5.232
11	13 53 15.77	2.0288	16 28 20.5	9.418	11	15 37 12.17	2.3074	22 27 12.5	5.116
12	13 55 17.65	2.0340	16 37 43.6	9.353	12	15 39 30.79	2.3133	22 32 16.0	4.999
13	13 57 19.85	2.0393	16 47 2.8	9.287	13	15 41 49.76	2.3190	22 37 12.4	4.882
14	13 59 22.36	2.0445	16 56 18.0	9.220	14	15 44 9.07	2.3247	22 42 1.8	4.763
15	14 1 25.19	2.0499	17 5 29.2	9.153	15	15 46 28.72	2.3304	22 46 43.9	4.642
16	14 3 28.35	2.0553	17 14 36.3	9.083	16	15 48 48.72	2.3361	22 51 18.8	4.520
17	14 5 31.83	2.0607	17 23 39.2	9.013	17	15 51 9.05	2.3417	22 55 46.3	4.398
18	14 7 35.63	2.0662	17 32 37.9	8.943	18	15 53 29.72	2.3473	23 0 6.5	4.275
19	14 9 39.77	2.0718	17 41 32.4	8.872	19	15 55 50.72	2.3528	23 4 19.3	4.151
20	14 11 44.24	2.0773	17 50 22.5	8.798	20	15 58 12.05	2.3583	23 8 24.6	4.025
21	14 13 49.04	2.0828	17 59 8.2	8.725	21	16 0 33.71	2.3638	23 12 22.3	3.898
22	14 15 54.18	2.0885	18 7 49.5	8.650	22	16 2 55.70	2.3691	23 16 12.3	3.770
23	14 17 59.66	2.0941	18 16 26.2	8.574	23	16 5 18.00	2.3743	23 19 54.7	3.642
24	14 20 5.47	2.0998	-18 24 58.4	-8.498	24	16 7 40.62	2.3797	-23 23 29.3	-3.512

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
JANUARY 9.									JANUARY 11.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	16	7	40.62	2.3797	-23	23	29.3	-3.512	0	18	6	26.48	2.5308	-23	26	41.8	+3.598
1	16	10	3.56	2.3848	23	26	56.1	3.381	1	18	8	58.34	2.5313	23	23	1.2	3.755
2	16	12	26.80	2.3899	23	30	15.0	3.249	2	18	11	30.23	2.5317	23	19	11.2	3.911
3	16	14	50.35	2.3951	23	33	26.0	3.116	3	18	14	2.14	2.5318	23	15	11.9	4.068
4	16	17	14.21	2.4002	23	36	28.9	2.982	4	18	16	34.05	2.5320	23	11	3.1	4.225
5	16	19	38.37	2.4051	23	39	23.8	2.848	5	18	19	5.98	2.5322	23	6	44.9	4.381
6	16	22	2.82	2.4099	23	42	10.6	2.713	6	18	21	37.91	2.5321	23	2	17.4	4.536
7	16	24	27.56	2.4148	23	44	49.3	2.575	7	18	24	9.83	2.5319	22	57	40.6	4.693
8	16	26	52.59	2.4195	23	47	19.6	2.437	8	18	26	41.74	2.5316	22	52	54.3	4.848
9	16	29	17.90	2.4242	23	49	41.7	2.299	9	18	29	13.62	2.5312	22	47	58.8	5.003
10	16	31	43.49	2.4288	23	51	55.5	2.160	10	18	31	45.48	2.5308	22	42	54.0	5.158
11	16	34	9.36	2.4333	23	54	0.9	2.019	11	18	34	17.31	2.5302	22	37	39.9	5.312
12	16	36	35.49	2.4378	23	55	57.8	1.878	12	18	36	49.10	2.5294	22	32	16.6	5.465
13	16	39	1.89	2.4421	23	57	46.2	1.736	13	18	39	20.84	2.5286	22	26	44.1	5.619
14	16	41	28.54	2.4463	23	59	26.1	1.593	14	18	41	52.53	2.5278	22	21	2.3	5.773
15	16	43	55.45	2.4505	24	0	57.4	1.449	15	18	44	24.17	2.5267	22	15	11.4	5.924
16	16	46	22.60	2.4546	24	2	20.0	1.305	16	18	46	55.73	2.5255	22	9	11.4	6.076
17	16	48	50.00	2.4587	24	3	34.0	1.160	17	18	49	27.23	2.5243	22	3	2.3	6.228
18	16	51	17.64	2.4625	24	4	39.2	1.013	18	18	51	58.65	2.5230	21	56	44.1	6.378
19	16	53	45.50	2.4663	24	5	35.6	0.867	19	18	54	29.99	2.5216	21	50	16.9	6.528
20	16	56	13.60	2.4701	24	6	23.2	0.719	20	18	57	1.24	2.5201	21	43	40.7	6.678
21	16	58	41.91	2.4737	24	7	1.9	0.571	21	18	59	32.40	2.5184	21	36	55.6	6.826
22	17	1	10.44	2.4772	24	7	31.7	0.423	22	19	2	3.45	2.5168	21	30	1.6	6.974
23	17	3	39.17	2.4806	-24	7	52.6	-0.273	23	19	4	34.41	2.5150	-21	22	58.7	+7.121
JANUARY 10.									JANUARY 12.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	17	6	8.11	2.4839	-24	8	4.5	-0.123	0	19	7	5.25	2.5131	-21	15	47.1	+7.267
1	17	8	37.24	2.4872	24	8	7.4	+0.028	1	19	9	35.98	2.5111	21	8	26.7	7.413
2	17	11	6.57	2.4903	24	8	1.2	0.179	2	19	12	6.58	2.5090	21	0	57.6	7.557
3	17	13	36.08	2.4933	24	7	45.9	0.331	3	19	14	37.06	2.5069	20	53	19.9	7.701
4	17	16	5.76	2.4962	24	7	21.5	0.483	4	19	17	7.41	2.5047	20	45	33.5	7.844
5	17	18	35.62	2.4990	24	6	47.9	0.636	5	19	19	37.62	2.5024	20	37	38.6	7.986
6	17	21	5.64	2.5017	24	6	5.2	0.789	6	19	22	7.70	2.5000	20	29	35.2	8.127
7	17	23	35.82	2.5043	24	5	13.2	0.943	7	19	24	37.62	2.4975	20	21	23.4	8.267
8	17	26	6.15	2.5067	24	4	12.0	1.097	8	19	27	7.40	2.4951	20	13	3.2	8.405
9	17	28	36.62	2.5090	24	3	1.6	1.252	9	19	29	37.03	2.4925	20	4	34.8	8.543
10	17	31	7.23	2.5113	24	1	41.8	1.407	10	19	32	6.50	2.4898	19	55	58.0	8.681
11	17	33	37.98	2.5135	24	0	12.8	1.562	11	19	34	35.80	2.4870	19	47	13.1	8.816
12	17	36	8.85	2.5155	23	58	34.4	1.718	12	19	37	4.94	2.4843	19	38	20.1	8.951
13	17	38	39.84	2.5173	23	56	46.7	1.873	13	19	39	33.91	2.4814	19	29	19.0	9.085
14	17	41	10.93	2.5192	23	54	49.6	2.030	14	19	42	2.71	2.4785	19	20	9.9	9.217
15	17	43	42.14	2.5208	23	52	43.1	2.186	15	19	44	31.33	2.4755	19	10	53.0	9.348
16	17	46	13.43	2.5223	23	50	27.3	2.342	16	19	46	59.77	2.4724	19	1	28.2	9.478
17	17	48	44.82	2.5238	23	48	2.1	2.499	17	19	49	28.02	2.4693	18	51	55.6	9.608
18	17	51	16.29	2.5252	23	45	27.4	2.656	18	19	51	56.09	2.4663	18	42	15.3	9.735
19	17	53	47.84	2.5264	23	42	43.4	2.813	19	19	54	23.97	2.4631	18	32	27.4	9.861
20	17	56	19.46	2.5275	23	39	49.3	2.970	20	19	56	51.66	2.4598	18	22	32.0	9.986
21	17	58	51.14	2.5284	23	36	47.0	3.127	21	19	59	19.15	2.4566	18	12	29.1	10.109
22	18	1	22.87	2.5293	23	33	34.7	3.283	22	20	1	46.45	2.4533	18	2	18.9	10.232
23	18	3	54.65	2.5301	23	30	13.0	3.441	23	20	4	13.54	2.4498	17	52	1.3	10.353
24	18	6	26.48	2.5308	-23	26	41.8	+3.598	24	20	6	40.43	2.4465	-17	41	36.5	+10.473

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
JANUARY 13.									JANUARY 15.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	20	6	40.43	2.4465	-17	41	36.5	+10.473	0	21	59	59.00	2.2794	-7	30	5.9	+14.381
1	20	9	7.12	2.4430	17	31	4.6	10.591	1	22	2	15.68	2.2767	7	15	41.8	14.422
2	20	11	33.59	2.4395	17	20	25.6	10.708	2	22	4	32.20	2.2739	7	1	15.3	14.461
3	20	13	59.86	2.4361	17	9	39.7	10.823	3	22	6	48.55	2.2711	6	46	46.5	14.498
4	20	16	25.92	2.4326	16	58	46.8	10.938	4	22	9	4.73	2.2683	6	32	15.6	14.533
5	20	18	51.77	2.4290	16	47	47.2	11.049	5	22	11	20.75	2.2658	6	17	42.5	14.568
6	20	21	17.40	2.4254	16	36	40.9	11.161	6	22	13	36.62	2.2632	6	3	7.5	14.599
7	20	23	42.82	2.4218	16	25	27.9	11.271	7	22	15	52.33	2.2606	5	48	30.6	14.631
8	20	26	8.02	2.4183	16	14	8.4	11.378	8	22	18	7.89	2.2581	5	33	51.8	14.660
9	20	28	33.01	2.4146	16	2	42.5	11.485	9	22	20	23.30	2.2556	5	19	11.4	14.687
10	20	30	57.77	2.4108	15	51	10.2	11.591	10	22	22	38.56	2.2533	5	4	29.4	14.713
11	20	33	22.31	2.4073	15	39	31.6	11.694	11	22	24	53.69	2.2509	4	49	45.9	14.737
12	20	35	46.64	2.4036	15	27	46.9	11.796	12	22	27	8.67	2.2486	4	35	1.0	14.759
13	20	38	10.74	2.3999	15	15	56.1	11.897	13	22	29	23.52	2.2464	4	20	14.8	14.779
14	20	40	34.63	2.3963	15	3	59.3	11.995	14	22	31	38.24	2.2443	4	5	27.5	14.798
15	20	42	58.29	2.3925	14	51	56.7	12.093	15	22	33	52.83	2.2421	3	50	39.0	14.817
16	20	45	21.73	2.3888	14	39	48.2	12.189	16	22	36	7.29	2.2401	3	35	49.5	14.833
17	20	47	44.94	2.3851	14	27	34.0	12.283	17	22	38	21.64	2.2381	3	20	59.1	14.846
18	20	50	7.94	2.3815	14	15	14.2	12.375	18	22	40	35.86	2.2361	3	6	8.0	14.858
19	20	52	30.72	2.3778	14	2	49.0	12.466	19	22	42	49.97	2.2343	2	51	16.1	14.871
20	20	54	53.27	2.3740	13	50	18.3	12.556	20	22	45	3.97	2.2325	2	36	23.5	14.880
21	20	57	15.60	2.3703	13	37	42.3	12.644	21	22	47	17.87	2.2308	2	21	30.5	14.888
22	20	59	37.71	2.3667	13	25	1.0	12.730	22	22	49	31.66	2.2290	2	6	37.0	14.894
23	21	1	59.60	2.3630	-13	12	14.7	+12.814	23	22	51	45.35	2.2273	-1	51	43.2	+14.898
JANUARY 14.									JANUARY 16.								
0	21	4	21.27	2.3593	-12	59	23.3	+12.898	0	22	53	58.94	2.2258	-1	36	49.2	+14.901
1	21	6	42.72	2.3558	12	46	27.0	12.978	1	22	56	12.44	2.2243	1	21	55.1	14.903
2	21	9	3.96	2.3521	12	33	25.9	13.058	2	22	58	25.86	2.2228	1	7	0.8	14.903
3	21	11	24.97	2.3484	12	20	20.1	13.135	3	23	0	39.18	2.2214	0	52	6.7	14.901
4	21	13	45.77	2.3449	12	7	9.7	13.212	4	23	2	52.43	2.2202	0	37	12.7	14.898
5	21	16	6.36	2.3413	11	53	54.7	13.287	5	23	5	5.60	2.2189	0	22	18.9	14.893
6	21	18	26.73	2.3378	11	40	35.3	13.359	6	23	7	18.70	2.2177	-0	7	25.5	14.888
7	21	20	46.90	2.3343	11	27	11.6	13.430	7	23	9	31.72	2.2165	+0	7	27.6	14.880
8	21	23	6.85	2.3308	11	13	43.7	13.500	8	23	11	44.68	2.2155	0	22	20.1	14.870
9	21	25	26.59	2.3273	11	0	11.6	13.568	9	23	13	57.58	2.2145	0	37	12.0	14.859
10	21	27	46.12	2.3238	10	46	35.6	13.633	10	23	16	10.42	2.2136	0	52	3.2	14.847
11	21	30	5.45	2.3205	10	32	55.6	13.698	11	23	18	23.21	2.2127	1	6	53.6	14.833
12	21	32	24.58	2.3172	10	19	11.8	13.761	12	23	20	35.94	2.2118	1	21	43.2	14.818
13	21	34	43.51	2.3138	10	5	21.3	13.822	13	23	22	48.63	2.2111	1	36	31.8	14.802
14	21	37	2.23	2.3104	9	51	33.2	13.881	14	23	25	1.27	2.2103	1	51	19.4	14.783
15	21	39	20.76	2.3072	9	37	38.6	13.938	15	23	27	13.87	2.2098	2	6	5.8	14.763
16	21	41	39.09	2.3039	9	23	40.6	13.994	16	23	29	26.44	2.2092	2	20	50.9	14.742
17	21	43	57.23	2.3008	9	9	39.3	14.049	17	23	31	38.97	2.2087	2	35	34.8	14.720
18	21	46	15.18	2.2976	8	55	34.7	14.102	18	23	33	51.48	2.2083	2	50	17.3	14.695
19	21	48	32.94	2.2945	8	41	27.1	14.153	19	23	36	3.96	2.2078	3	4	58.2	14.669
20	21	50	50.52	2.2914	8	27	16.4	14.202	20	23	38	16.42	2.2075	3	19	37.6	14.643
21	21	53	7.91	2.2883	8	13	2.9	14.248	21	23	40	28.86	2.2073	3	34	15.4	14.614
22	21	55	25.11	2.2853	7	58	46.6	14.295	22	23	42	41.29	2.2072	3	48	51.3	14.584
23	21	57	42.15	2.2824	7	44	27.5	14.339	23	23	44	53.72	2.2070	4	3	25.5	14.553
24	21	59	59.00	2.2794	-7	30	5.9	+14.381	24	23	47	6.13	2.2068	+4	17	57.7	+14.520

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 17.					JANUARY 19.				
0	h m s	s	" ' "	"	0	h m s	s	" ' "	"
0	23 47 6.13	2.2068	+ 4 17 57.7	+14.520	0	1 34 0.39	2.2654	+14 52 9.0	+11.430
1	23 49 18.54	2.2068	4 32 27.9	14.486	1	1 36 16.38	2.2675	15 3 32.0	11.338
2	23 51 30.95	2.2069	4 46 56.0	14.451	2	1 38 32.49	2.2697	15 14 49.5	11.243
3	23 53 43.37	2.2071	5 1 22.0	14.413	3	1 40 48.74	2.2720	15 26 1.2	11.148
4	23 55 55.80	2.2072	5 15 45.6	14.375	4	1 43 5.13	2.2743	15 37 7.2	11.052
5	23 58 8.23	2.2074	5 30 7.0	14.336	5	1 45 21.65	2.2764	15 48 7.4	10.954
6	0 0 20.69	2.2078	5 44 25.9	14.294	6	1 47 38.30	2.2787	15 59 1.7	10.856
7	0 2 33.17	2.2081	5 58 42.3	14.253	7	1 49 55.09	2.2810	16 9 50.1	10.757
8	0 4 45.66	2.2085	6 12 56.2	14.208	8	1 52 12.02	2.2833	16 20 32.5	10.657
9	0 6 58.19	2.2091	6 27 7.3	14.163	9	1 54 29.08	2.2856	16 31 8.9	10.556
10	0 9 10.75	2.2096	6 41 15.8	14.118	10	1 56 46.29	2.2879	16 41 39.2	10.453
11	0 11 23.34	2.2102	6 55 21.4	14.069	11	1 59 3.63	2.2902	16 52 3.3	10.350
12	0 13 35.97	2.2108	7 9 24.1	14.020	12	2 1 21.11	2.2925	17 2 21.2	10.246
13	0 15 48.64	2.2114	7 23 23.8	13.970	13	2 3 38.73	2.2948	17 12 32.8	10.141
14	0 18 1.34	2.2122	7 37 20.5	13.918	14	2 5 56.49	2.2973	17 22 38.1	10.035
15	0 20 14.10	2.2130	7 51 14.0	13.864	15	2 8 14.40	2.2996	17 32 37.0	9.928
16	0 22 26.90	2.2138	8 5 4.2	13.810	16	2 10 32.44	2.3018	17 42 29.4	9.820
17	0 24 39.76	2.2148	8 18 51.2	13.755	17	2 12 50.62	2.3043	17 52 15.4	9.712
18	0 26 52.67	2.2158	8 32 34.8	13.698	18	2 15 8.95	2.3066	18 1 54.8	9.601
19	0 29 5.65	2.2168	8 46 15.0	13.640	19	2 17 27.41	2.3088	18 11 27.5	9.490
20	0 31 18.68	2.2178	8 59 51.6	13.580	20	2 19 46.01	2.3113	18 20 53.6	9.379
21	0 33 31.79	2.2190	9 13 24.6	13.520	21	2 22 4.76	2.3136	18 30 13.0	9.267
22	0 35 44.96	2.2201	9 26 54.0	13.458	22	2 24 23.64	2.3158	18 39 25.6	9.153
23	0 37 58.20	2.2213	+ 9 40 19.6	+13.395	23	2 26 42.66	2.3182	+18 48 31.4	+ 9.039
JANUARY 18.					JANUARY 20.				
0	0 40 11.52	2.2227	+ 9 53 41.4	+13.331	0	2 29 1.82	2.3205	+18 57 30.3	+ 8.924
1	0 42 24.92	2.2239	10 6 59.3	13.265	1	2 31 21.12	2.3228	19 6 22.3	8.808
2	0 44 38.39	2.2253	10 20 13.2	13.198	2	2 33 40.55	2.3249	19 15 7.3	8.692
3	0 46 51.96	2.2268	10 33 23.1	13.130	3	2 36 0.11	2.3272	19 23 45.3	8.575
4	0 49 5.60	2.2282	10 46 28.8	13.060	4	2 38 19.81	2.3295	19 32 16.3	8.457
5	0 51 19.34	2.2298	10 59 30.3	12.990	5	2 40 39.65	2.3317	19 40 40.1	8.337
6	0 53 33.17	2.2313	11 12 27.6	12.919	6	2 42 59.61	2.3338	19 48 56.7	8.218
7	0 55 47.09	2.2328	11 25 20.6	12.846	7	2 45 19.71	2.3360	19 57 6.2	8.098
8	0 58 1.11	2.2345	11 38 9.1	12.771	8	2 47 39.93	2.3381	20 5 8.4	7.976
9	1 0 15.23	2.2362	11 50 53.1	12.696	9	2 50 0.28	2.3403	20 13 3.3	7.853
10	1 2 29.45	2.2379	12 3 32.6	12.620	10	2 52 20.76	2.3423	20 20 50.8	7.731
11	1 4 43.78	2.2397	12 16 7.5	12.543	11	2 54 41.36	2.3443	20 28 31.0	7.608
12	1 6 58.21	2.2414	12 28 37.7	12.463	12	2 57 2.08	2.3464	20 36 3.7	7.483
13	1 9 12.75	2.2433	12 41 3.1	12.383	13	2 59 22.93	2.3484	20 43 29.0	7.359
14	1 11 27.40	2.2451	12 53 23.7	12.303	14	3 1 43.89	2.3503	20 50 46.8	7.233
15	1 13 42.16	2.2469	13 5 39.4	12.220	15	3 4 4.97	2.3523	20 57 57.0	7.107
16	1 15 57.03	2.2488	13 17 50.1	12.136	16	3 6 26.17	2.3542	21 4 59.6	6.981
17	1 18 12.02	2.2509	13 29 55.7	12.052	17	3 8 47.47	2.3560	21 11 54.7	6.853
18	1 20 27.14	2.2529	13 41 56.3	11.967	18	3 11 8.89	2.3578	21 18 42.0	6.725
19	1 22 42.37	2.2548	13 53 51.7	11.880	19	3 13 30.41	2.3596	21 25 21.7	6.597
20	1 24 57.72	2.2569	14 5 41.9	11.793	20	3 15 52.04	2.3613	21 31 53.6	6.468
21	1 27 13.20	2.2590	14 17 26.8	11.703	21	3 18 13.77	2.3630	21 38 17.8	6.338
22	1 29 28.80	2.2611	14 29 6.3	11.613	22	3 20 35.60	2.3646	21 44 34.1	6.208
23	1 31 44.53	2.2633	14 40 40.4	11.523	23	3 22 57.52	2.3662	21 50 42.7	6.077
24	1 34 0.39	2.2654	+14 52 9.0	+11.430	24	3 25 19.54	2.3678	+21 56 43.3	+ 5.945

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 21.					JANUARY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	3 25 19.54	2.3678	+21 56 43.3	+5.945	0	5 19 31.37	2.3622	+24 4 59.0	-0.633
1	3 27 41.65	2.3693	22 2 36.1	5.813	1	5 21 53.04	2.3602	24 4 17.0	0.768
2	3 30 3.85	2.3707	22 8 20.9	5.681	2	5 24 14.59	2.3581	24 3 26.8	0.903
3	3 32 26.13	2.3720	22 13 57.8	5.548	3	5 26 36.01	2.3559	24 2 28.6	1.037
4	3 34 48.49	2.3733	22 19 26.7	5.415	4	5 28 57.30	2.3538	24 1 22.4	1.171
5	3 37 10.93	2.3746	22 24 47.6	5.282	5	5 31 18.46	2.3514	24 0 8.1	1.305
6	3 39 33.44	2.3758	22 30 0.5	5.148	6	5 33 39.47	2.3490	23 58 45.8	1.438
7	3 41 56.02	2.3769	22 35 5.3	5.013	7	5 36 0.34	2.3465	23 57 15.5	1.571
8	3 44 18.67	2.3780	22 40 2.0	4.878	8	5 38 21.05	2.3440	23 55 37.3	1.703
9	3 46 41.38	2.3790	22 44 50.6	4.743	9	5 40 41.62	2.3415	23 53 51.1	1.835
10	3 49 4.15	2.3799	22 49 31.1	4.607	10	5 43 2.03	2.3388	23 51 57.1	1.966
11	3 51 26.97	2.3808	22 54 3.4	4.471	11	5 45 22.28	2.3361	23 49 55.2	2.097
12	3 53 49.85	2.3818	22 58 27.6	4.335	12	5 47 42.36	2.3333	23 47 45.5	2.227
13	3 56 12.78	2.3825	23 2 43.6	4.198	13	5 50 2.27	2.3303	23 45 28.0	2.356
14	3 58 35.75	2.3832	23 6 51.3	4.061	14	5 52 22.00	2.3274	23 43 2.8	2.485
15	4 0 58.76	2.3838	23 10 50.9	3.924	15	5 54 41.56	2.3244	23 40 29.8	2.614
16	4 3 21.81	2.3843	23 14 42.2	3.786	16	5 57 0.93	2.3213	23 37 49.1	2.742
17	4 5 44.88	2.3848	23 18 25.2	3.648	17	5 59 20.12	2.3182	23 35 0.8	2.868
18	4 8 7.99	2.3853	23 22 0.0	3.511	18	6 1 39.11	2.3150	23 32 4.9	2.996
19	4 10 31.12	2.3857	23 25 26.5	3.373	19	6 3 57.92	2.3118	23 29 1.3	3.122
20	4 12 54.27	2.3859	23 28 44.7	3.234	20	6 6 16.52	2.3083	23 25 50.3	3.247
21	4 15 17.43	2.3861	23 31 54.6	3.096	21	6 8 34.92	2.3050	23 22 31.7	3.372
22	4 17 40.60	2.3863	23 34 56.2	2.958	22	6 10 53.12	2.3016	23 19 5.7	3.495
23	4 20 3.78	2.3863	+23 37 49.5	+2.818	23	6 13 11.11	2.2981	+23 15 32.3	-3.618
JANUARY 22.					JANUARY 24.				
0	4 22 26.96	2.3863	+23 40 34.4	+2.679	0	6 15 28.89	2.2946	+23 11 51.5	-3.741
1	4 24 50.14	2.3862	23 43 11.0	2.541	1	6 17 46.46	2.2909	23 8 3.4	3.863
2	4 27 13.30	2.3860	23 45 39.3	2.403	2	6 20 3.80	2.2873	23 4 8.0	3.984
3	4 29 36.46	2.3858	23 47 59.3	2.263	3	6 22 20.93	2.2835	23 0 5.3	4.104
4	4 31 59.60	2.3854	23 50 10.9	2.124	4	6 24 37.82	2.2798	22 55 55.5	4.224
5	4 34 22.71	2.3850	23 52 14.2	1.986	5	6 26 54.50	2.2760	22 51 38.4	4.343
6	4 36 45.80	2.3846	23 54 9.2	1.847	6	6 29 10.94	2.2720	22 47 14.3	4.460
7	4 39 8.86	2.3840	23 55 55.8	1.708	7	6 31 27.14	2.2681	22 42 43.2	4.578
8	4 41 31.88	2.3833	23 57 34.1	1.568	8	6 33 43.11	2.2643	22 38 5.0	4.694
9	4 43 54.86	2.3827	23 59 4.0	1.429	9	6 35 58.85	2.2602	22 33 19.9	4.810
10	4 46 17.80	2.3818	24 0 25.6	1.291	10	6 38 14.33	2.2561	22 28 27.8	4.925
11	4 48 40.68	2.3809	24 1 38.9	1.153	11	6 40 29.58	2.2521	22 23 28.9	5.038
12	4 51 3.51	2.3800	24 2 43.9	1.014	12	6 42 44.58	2.2479	22 18 23.2	5.152
13	4 53 26.28	2.3789	24 3 40.6	0.875	13	6 44 59.33	2.2437	22 13 10.7	5.264
14	4 55 48.98	2.3778	24 4 28.9	0.737	14	6 47 13.82	2.2395	22 7 51.5	5.375
15	4 58 11.61	2.3766	24 5 9.0	0.599	15	6 49 28.07	2.2353	22 2 25.7	5.485
16	5 0 34.17	2.3753	24 5 40.8	0.462	16	6 51 42.05	2.2309	21 56 53.3	5.596
17	5 2 56.65	2.3740	24 6 4.4	0.324	17	6 53 55.78	2.2267	21 51 14.2	5.705
18	5 5 19.05	2.3725	24 6 19.7	0.186	18	6 56 9.25	2.2223	21 45 28.7	5.812
19	5 7 41.35	2.3709	24 6 26.7	+0.048	19	6 58 22.46	2.2179	21 39 36.8	5.919
20	5 10 3.56	2.3693	24 6 25.5	-0.088	20	7 0 35.40	2.2135	21 33 38.4	6.026
21	5 12 25.67	2.3677	24 6 16.2	-0.224	21	7 2 48.08	2.2091	21 27 33.7	6.131
22	5 14 47.68	2.3659	24 5 58.6	-0.361	22	7 5 0.49	2.2047	21 21 22.7	6.235
23	5 17 9.58	2.3641	24 5 32.9	-0.497	23	7 7 12.64	2.2002	21 15 5.5	6.338
24	5 19 31.37	2.3622	+24 4 59.0	-0.633	24	7 9 24.51	2.1957	+21 8 42.1	-6.441

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.				
JANUARY 25.							JANUARY 27.										
	h	m	s	s	°	'	"		h	m	s	s	°	'	"	"	
0	7	9	24.51	2.1957	+21	8	42.1	-6.441	0	8	49	30.39	1.9788	+14	19	49.8	-10.221
1	7	11	36.12	2.1912	21	2	12.6	6.543	1	8	51	29.00	1.9748	14	9	34.9	10.277
2	7	13	47.45	2.1866	20	55	37.0	6.643	2	8	53	27.36	1.9707	13	59	16.6	10.332
3	7	15	58.51	2.1821	20	48	55.5	6.743	3	8	55	25.48	1.9668	13	48	55.1	10.384
4	7	18	9.30	2.1775	20	42	7.9	6.842	4	8	57	23.37	1.9628	13	38	30.5	10.437
5	7	20	19.81	2.1728	20	35	14.5	6.938	5	8	59	21.02	1.9588	13	28	2.7	10.488
6	7	22	30.04	2.1682	20	28	15.3	7.036	6	9	1	18.43	1.9549	13	17	31.9	10.538
7	7	24	39.99	2.1636	20	21	10.2	7.132	7	9	3	15.61	1.9512	13	6	58.1	10.588
8	7	26	49.67	2.1590	20	13	59.5	7.226	8	9	5	12.57	1.9473	12	56	21.3	10.638
9	7	28	59.07	2.1543	20	6	43.1	7.321	9	9	7	9.29	1.9435	12	45	41.6	10.685
10	7	31	8.18	2.1496	19	59	21.0	7.413	10	9	9	5.79	1.9398	12	34	59.1	10.732
11	7	33	17.02	2.1449	19	51	53.5	7.505	11	9	11	2.07	1.9362	12	24	13.8	10.778
12	7	35	25.57	2.1403	19	44	20.4	7.597	12	9	12	58.13	1.9325	12	13	25.7	10.823
13	7	37	33.85	2.1357	19	36	41.9	7.687	13	9	14	53.97	1.9289	12	2	35.0	10.868
14	7	39	41.85	2.1310	19	28	58.0	7.776	14	9	16	49.60	1.9254	11	51	41.6	10.911
15	7	41	49.57	2.1263	19	21	8.8	7.863	15	9	18	45.02	1.9218	11	40	45.7	10.953
16	7	43	57.01	2.1217	19	13	14.4	7.950	16	9	20	40.22	1.9183	11	29	47.2	10.995
17	7	46	4.17	2.1170	19	5	14.8	8.037	17	9	22	35.22	1.9149	11	18	46.3	11.036
18	7	48	11.05	2.1123	18	57	10.0	8.123	18	9	24	30.01	1.9115	11	7	42.9	11.076
19	7	50	17.65	2.1077	18	49	0.1	8.206	19	9	26	24.60	1.9082	10	56	37.2	11.115
20	7	52	23.97	2.1030	18	40	45.3	8.289	20	9	28	18.99	1.9049	10	45	29.1	11.153
21	7	54	30.01	2.0983	18	32	25.4	8.372	21	9	30	13.19	1.9017	10	34	18.8	11.190
22	7	56	35.77	2.0937	18	24	0.7	8.453	22	9	32	7.19	1.8983	10	23	6.3	11.227
23	7	58	41.25	2.0890	+18	15	31.1	-8.533	23	9	34	0.99	1.8952	+10	11	51.6	-11.263
JANUARY 26.							JANUARY 28.										
0	8	0	46.45	2.0844	+18	6	56.8	-8.612	0	9	35	54.61	1.8921	+10	0	34.8	-11.298
1	8	2	51.38	2.0798	17	58	17.7	8.690	1	9	37	48.04	1.8890	9	49	15.9	11.331
2	8	4	56.02	2.0751	17	49	34.0	8.768	2	9	39	41.29	1.8861	9	37	55.1	11.364
3	8	7	0.39	2.0706	17	40	45.6	8.844	3	9	41	34.37	1.8831	9	26	32.2	11.398
4	8	9	4.49	2.0660	17	31	52.7	8.918	4	9	43	27.26	1.8801	9	15	7.4	11.428
5	8	11	8.31	2.0614	17	22	55.4	8.993	5	9	45	19.98	1.8772	9	3	40.8	11.458
6	8	13	11.86	2.0569	17	13	53.5	9.067	6	9	47	12.52	1.8743	8	52	12.4	11.489
7	8	15	15.14	2.0523	17	4	47.4	9.139	7	9	49	4.90	1.8717	8	40	42.1	11.518
8	8	17	18.14	2.0478	16	55	36.8	9.211	8	9	50	57.12	1.8689	8	29	10.2	11.547
9	8	19	20.88	2.0433	16	46	22.1	9.281	9	9	52	49.17	1.8662	8	17	36.5	11.574
10	8	21	23.34	2.0388	16	37	3.1	9.350	10	9	54	41.06	1.8635	8	6	1.3	11.600
11	8	23	25.54	2.0344	16	27	40.1	9.418	11	9	56	32.79	1.8609	7	54	24.5	11.627
12	8	25	27.47	2.0300	16	18	12.9	9.487	12	9	58	24.37	1.8584	7	42	46.1	11.652
13	8	27	29.14	2.0256	16	8	41.7	9.553	13	10	0	15.80	1.8560	7	31	6.3	11.676
14	8	29	30.54	2.0212	15	59	6.6	9.618	14	10	2	7.09	1.8535	7	19	25.0	11.700
15	8	31	31.68	2.0168	15	49	27.5	9.683	15	10	3	58.22	1.8511	7	7	42.3	11.723
16	8	33	32.56	2.0125	15	39	44.7	9.746	16	10	5	49.22	1.8488	6	55	58.3	11.745
17	8	35	33.18	2.0082	15	29	58.0	9.809	17	10	7	40.08	1.8466	6	44	12.9	11.767
18	8	37	33.54	2.0038	15	20	7.6	9.871	18	10	9	30.81	1.8443	6	32	26.3	11.787
19	8	39	33.61	1.9996	15	10	13.5	9.933	19	10	11	21.40	1.8422	6	20	38.5	11.806
20	8	41	33.49	1.9954	15	0	15.7	9.992	20	10	13	11.87	1.8401	6	8	49.6	11.825
21	8	43	33.09	1.9913	14	50	14.5	10.050	21	10	15	2.21	1.8380	5	56	59.5	11.844
22	8	45	32.44	1.9871	14	40	9.7	10.109	22	10	16	52.43	1.8360	5	45	8.3	11.861
23	8	47	31.54	1.9829	14	30	1.4	10.166	23	10	18	42.53	1.8341	5	33	16.2	11.878
24	8	49	30.39	1.9788	+14	19	49.8	-10.221	24	10	20	32.52	1.8322	+5	21	23.0	-11.894

GREENWICH MEAN TIME.

ur.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.				
JANUARY 29.							JANUARY 31.										
	h	m	s	s	°	'	"		h	m	s	s	°	'	"	"	
0	10	20	32.52	1.8322	+5	21	23.0	-11.894	0	11	47	21.55	1.8073	-4	14	47.8	-11.858
1	10	22	22.39	1.8303	5	9	28.9	11.909	1	11	49	10.01	1.8081	4	26	38.8	11.841
2	10	24	12.16	1.8285	4	57	33.9	11.923	2	11	50	58.52	1.8090	4	38	28.7	11.823
3	10	26	1.81	1.8268	4	45	38.1	11.938	3	11	52	47.09	1.8101	4	50	17.6	11.806
4	10	27	51.37	1.8252	4	33	41.4	11.951	4	11	54	35.73	1.8112	5	2	5.4	11.788
5	10	29	40.83	1.8235	4	21	44.0	11.963	5	11	56	24.43	1.8123	5	13	52.1	11.768
6	10	31	30.19	1.8219	4	9	45.8	11.975	6	11	58	13.20	1.8135	5	25	37.6	11.748
7	10	33	19.46	1.8204	3	57	47.0	11.986	7	12	0	2.05	1.8148	5	37	21.9	11.728
8	10	35	8.64	1.8189	3	45	47.5	11.996	8	12	1	50.97	1.8160	5	49	4.9	11.707
9	10	36	57.73	1.8175	3	33	47.5	12.005	9	12	3	39.97	1.8173	6	0	46.7	11.685
0	10	38	46.74	1.8162	3	21	46.9	12.015	10	12	5	29.05	1.8188	6	12	27.1	11.663
1	10	40	35.67	1.8149	3	9	45.7	12.023	11	12	7	18.23	1.8203	6	24	6.2	11.639
2	10	42	24.53	1.8137	2	57	44.1	12.030	12	12	9	7.49	1.8218	6	35	43.8	11.615
3	10	44	13.31	1.8125	2	45	42.1	12.037	13	12	10	56.85	1.8234	6	47	20.0	11.591
4	10	46	2.03	1.8113	2	33	39.7	12.043	14	12	12	46.30	1.8251	6	58	54.7	11.566
5	10	47	50.67	1.8103	2	21	36.9	12.049	15	12	14	35.86	1.8268	7	10	27.9	11.540
6	10	49	39.26	1.8093	2	9	33.8	12.053	16	12	16	25.52	1.8286	7	21	59.5	11.514
7	10	51	27.78	1.8083	1	57	30.5	12.058	17	12	18	15.29	1.8304	7	33	29.6	11.488
8	10	53	16.25	1.8074	1	45	26.9	12.062	18	12	20	5.17	1.8323	7	44	58.0	11.459
9	10	55	4.67	1.8066	1	33	23.1	12.064	19	12	21	55.16	1.8342	7	56	24.7	11.431
10	10	56	53.04	1.8058	1	21	19.2	12.066	20	12	23	45.27	1.8363	8	7	49.7	11.402
11	10	58	41.36	1.8050	1	9	15.2	12.067	21	12	25	35.51	1.8383	8	19	12.9	11.373
12	11	0	29.64	1.8043	0	57	11.2	12.068	22	12	27	25.87	1.8404	8	30	34.4	11.343
13	11	2	17.88	1.8038	+0	45	7.1	-12.068	23	12	29	16.36	1.8426	-8	41	54.0	-11.311
JANUARY 30.							FEBRUARY 1.										
	h	m	s	s	°	'	"		h	m	s	s	°	'	"	"	
0	11	4	6.09	1.8033	+0	33	3.0	-12.068	0	12	31	6.98	1.8448	-8	53	11.7	-11.279
1	11	5	54.27	1.8028	-0	20	59.0	12.066	1	12	32	57.74	1.8472	9	4	27.5	11.248
2	11	7	42.42	1.8023	+0	8	55.1	12.063	2	12	34	48.64	1.8495	9	15	41.4	11.215
3	11	9	30.54	1.8018	-0	3	8.6	12.061	3	12	36	39.68	1.8519	9	26	53.3	11.181
4	11	11	18.64	1.8015	0	15	12.2	12.058	4	12	38	30.87	1.8544	9	38	3.1	11.147
5	11	13	6.72	1.8013	0	27	15.6	12.054	5	12	40	22.21	1.8569	9	49	10.9	11.112
6	11	14	54.79	1.8011	0	39	18.7	12.050	6	12	42	13.70	1.8595	10	0	16.5	11.076
7	11	16	42.85	1.8009	0	51	21.6	12.045	7	12	44	5.35	1.8622	10	11	20.0	11.040
8	11	18	30.90	1.8008	1	3	24.1	12.039	8	12	45	57.16	1.8648	10	22	21.3	11.003
9	11	20	18.95	1.8008	1	15	26.3	12.033	9	12	47	49.13	1.8676	10	33	20.4	10.966
10	11	22	6.99	1.8008	1	27	28.0	12.025	10	12	49	41.27	1.8704	10	44	17.2	10.927
11	11	23	55.04	1.8009	1	39	29.3	12.018	11	12	51	33.58	1.8733	10	55	11.6	10.888
12	11	25	43.10	1.8011	1	51	30.1	12.009	12	12	53	26.06	1.8762	11	6	3.7	10.848
13	11	27	31.17	1.8012	2	3	30.4	12.000	13	12	55	18.72	1.8792	11	16	53.4	10.808
14	11	29	19.24	1.8014	2	15	30.1	11.990	14	12	57	11.56	1.8822	11	27	40.6	10.767
15	11	31	7.34	1.8018	2	27	29.2	11.979	15	12	59	4.58	1.8853	11	38	25.4	10.725
16	11	32	55.46	1.8022	2	39	27.6	11.968	16	13	0	57.79	1.8883	11	49	7.6	10.683
17	11	34	43.60	1.8025	2	51	25.4	11.958	17	13	2	51.18	1.8915	11	59	47.3	10.639
18	11	36	31.76	1.8030	3	3	22.5	11.945	18	13	4	44.77	1.8948	12	10	24.3	10.595
19	11	38	19.96	1.8037	3	15	18.8	11.933	19	13	6	38.56	1.8982	12	20	58.7	10.551
20	11	40	8.20	1.8043	3	27	14.4	11.919	20	13	8	32.55	1.9015	12	31	30.4	10.505
21	11	41	56.47	1.8048	3	39	9.1	11.904	21	13	10	26.74	1.9049	12	41	59.3	10.459
22	11	43	44.78	1.8056	3	51	2.9	11.889	22	13	12	21.14	1.9083	12	52	25.5	10.413
23	11	45	33.14	1.8064	4	2	55.8	11.874	23	13	14	15.74	1.9118	13	2	48.8	10.364
24	11	47	21.55	1.8073	-4	14	47.8	-11.858	24	13	16	10.56	1.9154	-13	13	9.2	-10.316

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 2.					FEBRUARY 4.				
0	h m s	s	" "	"	0	h m s	s	" "	"
0	13 16 10.56	1.9154	-13 13 9.2	-10.316	0	14 53 6.91	2.1384	-20 17 18.8	-7.025
1	13 18 5.59	1.9191	13 23 26.7	10.267	1	14 55 15.38	2.1438	20 24 17.6	6.935
2	13 20 0.85	1.9228	13 33 41.2	10.217	2	14 57 24.17	2.1493	20 31 11.0	6.843
3	13 21 56.32	1.9264	13 43 52.7	10.166	3	14 59 33.29	2.1547	20 37 58.8	6.750
4	13 23 52.02	1.9303	13 54 1.1	10.115	4	15 1 42.73	2.1601	20 44 41.0	6.656
5	13 25 47.95	1.9341	14 4 6.5	10.063	5	15 3 52.50	2.1656	20 51 17.5	6.562
6	13 27 44.11	1.9380	14 14 8.7	10.010	6	15 6 2.60	2.1710	20 57 48.4	6.467
7	13 29 40.51	1.9419	14 24 7.7	9.956	7	15 8 13.02	2.1764	21 4 13.5	6.370
8	13 31 37.14	1.9458	14 34 3.4	9.902	8	15 10 23.77	2.1819	21 10 32.8	6.273
9	13 33 34.01	1.9499	14 43 55.9	9.847	9	15 12 34.85	2.1874	21 16 46.2	6.173
10	13 35 31.13	1.9540	14 53 45.0	9.790	10	15 14 46.26	2.1929	21 22 53.6	6.073
11	13 37 28.49	1.9581	15 3 30.7	9.733	11	15 16 58.00	2.1984	21 28 55.0	5.973
12	13 39 26.10	1.9623	15 13 13.0	9.676	12	15 19 10.07	2.2039	21 34 50.4	5.873
13	13 41 23.96	1.9665	15 22 51.8	9.618	13	15 21 22.47	2.2094	21 40 39.7	5.769
14	13 43 22.08	1.9708	15 32 27.1	9.558	14	15 23 35.20	2.2148	21 46 22.7	5.666
15	13 45 20.45	1.9751	15 41 58.8	9.498	15	15 25 48.25	2.2203	21 51 59.6	5.562
16	13 47 19.09	1.9794	15 51 26.9	9.438	16	15 28 1.63	2.2258	21 57 30.1	5.456
17	13 49 17.98	1.9838	16 0 51.3	9.375	17	15 30 15.34	2.2313	22 2 54.3	5.350
18	13 51 17.14	1.9883	16 10 11.9	9.313	18	15 32 29.38	2.2367	22 8 12.1	5.243
19	13 53 16.58	1.9928	16 19 28.8	9.249	19	15 34 43.74	2.2421	22 13 23.4	5.133
20	13 55 16.28	1.9973	16 28 41.8	9.185	20	15 36 58.43	2.2475	22 18 28.1	5.024
21	13 57 16.25	2.0018	16 37 51.0	9.121	21	15 39 13.44	2.2528	22 23 26.3	4.914
22	13 59 16.50	2.0065	16 46 56.3	9.054	22	15 41 28.77	2.2583	22 28 17.8	4.803
23	14 1 17.03	2.0112	-16 55 57.5	-8.987	23	15 43 44.43	2.2637	-22 33 2.6	-4.690
FEBRUARY 3.					FEBRUARY 5.				
0	h m s	s	" "	"	0	h m s	s	" "	"
0	14 3 17.84	2.0158	-17 4 54.7	-8.919	0	15 46 0.41	2.2690	-22 37 40.6	-4.577
1	14 5 18.93	2.0206	17 13 47.8	8.851	1	15 48 16.71	2.2743	22 42 11.8	4.463
2	14 7 20.31	2.0253	17 22 36.8	8.782	2	15 50 33.33	2.2797	22 46 36.1	4.347
3	14 9 21.97	2.0302	17 31 21.6	8.711	3	15 52 50.27	2.2849	22 50 53.4	4.230
4	14 11 23.93	2.0350	17 40 2.1	8.640	4	15 55 7.52	2.2902	22 55 3.7	4.113
5	14 13 26.17	2.0399	17 48 38.4	8.568	5	15 57 25.09	2.2954	22 59 7.0	3.995
6	14 15 28.72	2.0448	17 57 10.3	8.495	6	15 59 42.97	2.3005	23 3 3.1	3.875
7	14 17 31.55	2.0498	18 5 37.8	8.421	7	16 2 1.15	2.3057	23 6 52.0	3.756
8	14 19 34.69	2.0548	18 14 0.8	8.347	8	16 4 19.65	2.3109	23 10 33.8	3.635
9	14 21 38.13	2.0598	18 22 19.4	8.271	9	16 6 38.46	2.3159	23 14 8.2	3.513
10	14 23 41.87	2.0648	18 30 33.3	8.194	10	16 8 57.56	2.3209	23 17 35.3	3.389
11	14 25 45.91	2.0699	18 38 42.7	8.118	11	16 11 16.97	2.3260	23 20 54.9	3.265
12	14 27 50.26	2.0751	18 46 47.4	8.039	12	16 13 36.68	2.3310	23 24 7.1	3.141
13	14 29 54.92	2.0803	18 54 47.4	7.960	13	16 15 56.69	2.3359	23 27 11.8	3.015
14	14 31 59.89	2.0853	19 2 42.6	7.879	14	16 18 16.99	2.3408	23 30 8.9	2.888
15	14 34 5.16	2.0905	19 10 32.9	7.798	15	16 20 37.58	2.3456	23 32 58.3	2.760
16	14 36 10.75	2.0958	19 18 18.4	7.717	16	16 22 58.46	2.3504	23 35 40.1	2.632
17	14 38 16.66	2.1011	19 25 58.9	7.633	17	16 25 19.63	2.3552	23 38 14.1	2.503
18	14 40 22.88	2.1063	19 33 34.3	7.549	18	16 27 41.08	2.3598	23 40 40.4	2.373
19	14 42 29.42	2.1116	19 41 4.8	7.464	19	16 30 2.81	2.3645	23 42 58.8	2.241
20	14 44 36.27	2.1169	19 48 30.0	7.378	20	16 32 24.82	2.3690	23 45 9.3	2.109
21	14 46 43.45	2.1223	19 55 50.2	7.292	21	16 34 47.09	2.3735	23 47 11.9	1.977
22	14 48 50.95	2.1277	20 3 5.0	7.203	22	16 37 9.64	2.3780	23 49 6.5	1.843
23	14 50 58.77	2.1330	20 10 14.6	7.115	23	16 39 32.45	2.3824	23 50 53.0	1.708
24	14 53 6.91	2.1384	-20 17 18.8	-7.025	24	16 41 55.53	2.3868	-23 52 31.5	-1.573

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 6.				FEBRUARY 8.				
m s	s	° ' "	"		h m s	s	° ' "	"
41 55.53	2.3868	-23 52 31.5	-1.573	0	18 40 0.99	2.4998	-22 20 57.6	+ 5.518
44 18.87	2.3911	23 54 1.8	1.438	1	18 42 30.98	2.4999	22 15 22.0	5.669
46 42.46	2.3953	23 55 24.0	1.301	2	18 45 0.98	2.4999	22 9 37.3	5.820
49 6.30	2.3994	23 56 37.9	1.163	3	18 47 30.97	2.4998	22 3 43.6	5.970
51 30.39	2.4035	23 57 43.5	1.025	4	18 50 0.96	2.4998	21 57 40.9	6.120
53 54.72	2.4074	23 58 40.9	0.886	5	18 52 30.94	2.4995	21 51 29.2	6.270
56 19.28	2.4114	23 59 29.8	0.746	6	18 55 0.90	2.4992	21 45 8.5	6.419
58 44.09	2.4154	24 0 10.4	0.606	7	18 57 30.84	2.4988	21 38 38.9	6.568
1 9.13	2.4192	24 0 42.5	0.464	8	19 0 0.76	2.4983	21 32 0.4	6.717
3 34.39	2.4228	24 1 6.1	0.323	9	19 2 30.64	2.4978	21 25 12.9	6.865
5 59.87	2.4265	24 1 21.2	0.180	10	19 5 0.49	2.4971	21 18 16.6	7.012
8 25.57	2.4301	24 1 27.7	-0.037	11	19 7 30.29	2.4963	21 11 11.5	7.158
10 51.48	2.4336	24 1 25.6	+0.107	12	19 10 0.05	2.4956	21 3 57.6	7.305
13 17.60	2.4370	24 1 14.9	0.252	13	19 12 29.76	2.4947	20 56 34.9	7.451
15 43.92	2.4403	24 0 55.4	0.397	14	19 14 59.41	2.4938	20 49 3.5	7.595
18 10.43	2.4435	24 0 27.3	0.542	15	19 17 29.01	2.4928	20 41 23.5	7.740
20 37.14	2.4467	23 59 50.4	0.688	16	19 19 58.54	2.4916	20 33 34.7	7.884
23 4.03	2.4498	23 59 4.7	0.835	17	19 22 28.00	2.4904	20 25 37.4	8.026
25 31.11	2.4528	23 58 10.2	0.982	18	19 24 57.39	2.4893	20 17 31.6	8.168
27 58.36	2.4557	23 57 6.9	1.130	19	19 27 26.71	2.4880	20 9 17.2	8.310
30 25.79	2.4585	23 55 54.6	1.278	20	19 29 55.95	2.4866	20 0 54.4	8.451
32 53.38	2.4612	23 54 33.5	1.426	21	19 32 25.10	2.4851	19 52 23.1	8.591
35 21.13	2.4638	23 53 3.5	1.575	22	19 34 54.16	2.4837	19 43 43.5	8.729
37 49.03	2.4663	-23 51 24.5	+1.725	23	19 37 23.14	2.4821	-19 34 55.6	+ 8.867
FEBRUARY 7.				FEBRUARY 9.				
40 17.09	2.4688	-23 49 36.5	+1.875	0	19 39 52.01	2.4804	-19 25 59.5	+ 9.003
42 45.29	2.4713	23 47 39.5	2.024	1	19 42 20.79	2.4788	19 16 55.2	9.140
45 13.64	2.4735	23 45 33.6	2.175	2	19 44 49.46	2.4769	19 7 42.7	9.276
47 42.11	2.4757	23 43 18.5	2.326	3	19 47 18.02	2.4752	18 58 22.1	9.410
50 10.72	2.4778	23 40 54.5	2.477	4	19 49 46.48	2.4734	18 48 53.5	9.543
52 39.44	2.4798	23 38 21.3	2.628	5	19 52 14.83	2.4714	18 39 17.0	9.674
55 8.29	2.4817	23 35 39.1	2.780	6	19 54 43.05	2.4694	18 29 32.6	9.806
57 37.24	2.4834	23 32 47.7	2.932	7	19 57 11.16	2.4675	18 19 40.3	9.936
2 6.30	2.4852	23 29 47.3	3.083	8	19 59 39.15	2.4654	18 9 40.3	10.065
2 35.46	2.4868	23 26 37.7	3.235	9	20 2 7.01	2.4633	17 59 32.5	10.193
5 4.72	2.4883	23 23 19.1	3.387	10	20 4 34.75	2.4613	17 49 17.2	10.319
7 34.06	2.4897	23 19 51.3	3.540	11	20 7 2.36	2.4590	17 38 54.2	10.445
10 3.48	2.4910	23 16 14.3	3.693	12	20 9 29.83	2.4568	17 28 23.8	10.568
12 32.98	2.4923	23 12 28.2	3.845	13	20 11 57.17	2.4546	17 17 46.0	10.692
15 2.56	2.4935	23 8 32.9	3.998	14	20 14 24.38	2.4523	17 7 0.8	10.813
17 32.20	2.4945	23 4 28.5	4.150	15	20 16 51.44	2.4499	16 56 8.4	10.933
20 1.90	2.4954	23 0 14.9	4.303	16	20 19 18.37	2.4476	16 45 8.8	11.053
22 31.65	2.4963	22 55 52.2	4.455	17	20 21 45.15	2.4452	16 34 2.0	11.172
25 1.46	2.4971	22 51 20.3	4.608	18	20 24 11.79	2.4428	16 22 48.2	11.288
27 31.30	2.4978	22 46 39.3	4.759	19	20 26 38.29	2.4404	16 11 27.5	11.403
30 1.19	2.4984	22 41 49.2	4.911	20	20 29 4.64	2.4379	15 59 59.9	11.517
32 31.11	2.4988	22 36 50.0	5.063	21	20 31 30.84	2.4354	15 48 25.5	11.629
35 1.05	2.4992	22 31 41.6	5.215	22	20 33 56.89	2.4328	15 36 44.4	11.740
37 31.01	2.4995	22 26 24.2	5.367	23	20 36 22.78	2.4303	15 24 56.7	11.850
40 0.99	2.4998	-22 20 57.6	+5.518	24	20 38 48.53	2.4279	-15 13 2.4	+11.958

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 10.					FEBRUARY 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 38 48.53	2.4279	-15 13 2.4	+11.958	0	22 32 29.83	2.3173	-4 5 26.5	+15.183
1	20 41 14.13	2.4253	15 1 1.7	12.065	1	22 34 48.82	2.3158	3 50 14.8	15.207
2	20 43 39.57	2.4227	14 48 54.6	12.170	2	22 37 7.73	2.3143	3 35 1.7	15.228
3	20 46 4.85	2.4201	14 36 41.3	12.273	3	22 39 26.54	2.3128	3 19 47.4	15.248
4	20 48 29.98	2.4176	14 24 21.8	12.376	4	22 41 45.27	2.3114	3 4 32.0	15.265
5	20 50 54.96	2.4150	14 11 56.2	12.477	5	22 44 3.91	2.3100	2 49 15.6	15.280
6	20 53 19.78	2.4123	13 59 24.6	12.575	6	22 46 22.47	2.3088	2 33 58.4	15.293
7	20 55 44.44	2.4098	13 46 47.2	12.673	7	22 48 40.96	2.3075	2 18 40.4	15.306
8	20 58 8.95	2.4072	13 34 3.9	12.769	8	22 50 59.37	2.3063	2 3 21.7	15.316
9	21 0 33.30	2.4046	13 21 14.9	12.863	9	22 53 17.71	2.3052	1 48 2.5	15.324
10	21 2 57.50	2.4020	13 8 20.3	12.957	10	22 55 35.99	2.3041	1 32 42.8	15.331
11	21 5 21.54	2.3993	12 55 20.1	13.048	11	22 57 54.20	2.3029	1 17 22.8	15.335
12	21 7 45.42	2.3968	12 42 14.6	13.136	12	23 0 12.34	2.3018	1 2 2.6	15.338
13	21 10 9.15	2.3942	12 29 3.8	13.224	13	23 2 30.42	2.3009	0 46 42.3	15.338
14	21 12 32.72	2.3915	12 15 47.7	13.310	14	23 4 48.45	2.3001	0 31 22.1	15.337
15	21 14 56.13	2.3889	12 2 26.6	13.394	15	23 7 6.43	2.2992	0 16 1.9	15.334
16	21 17 19.39	2.3864	11 49 0.4	13.478	16	23 9 24.35	2.2983	-0 0 42.0	15.329
17	21 19 42.50	2.3838	11 35 29.3	13.559	17	23 11 42.22	2.2976	+0 14 37.6	15.323
18	21 22 5.45	2.3813	11 21 53.3	13.638	18	23 14 0.06	2.2969	0 29 56.8	15.315
19	21 24 28.26	2.3788	11 8 12.7	13.715	19	23 16 17.85	2.2962	0 45 15.4	15.304
20	21 26 50.91	2.3763	10 54 27.5	13.792	20	23 18 35.60	2.2956	-1 0 33.3	15.293
21	21 29 13.41	2.3738	10 40 37.7	13.866	21	23 20 53.32	2.2950	1 15 50.5	15.279
22	21 31 35.76	2.3713	10 26 43.6	13.938	22	23 23 11.00	2.2944	-1 31 6.8	15.264
23	21 33 57.96	2.3688	-10 12 45.1	+14.009	23	23 25 28.65	2.2940	+1 46 22.2	+15.247
FEBRUARY 11.					FEBRUARY 13.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 36 20.02	2.3664	-9 58 42.5	+14.078	0	23 27 46.28	2.2937	+2 1 36.4	+15.227
1	21 38 41.93	2.3640	9 44 35.8	14.144	1	23 30 3.89	2.2933	2 16 49.4	15.207
2	21 41 3.70	2.3616	9 30 25.2	14.210	2	23 32 21.47	2.2929	2 32 1.2	15.184
3	21 43 25.32	2.3592	9 16 10.6	14.273	3	23 34 39.04	2.2928	2 47 11.5	15.159
4	21 45 46.80	2.3569	9 1 52.4	14.335	4	23 36 56.60	2.2925	3 2 20.3	15.134
5	21 48 8.15	2.3546	8 47 30.4	14.396	5	23 39 14.14	2.2923	3 17 27.6	15.107
6	21 50 29.35	2.3523	8 33 4.9	14.453	6	23 41 31.68	2.2923	3 32 33.1	15.077
7	21 52 50.42	2.3501	8 18 36.0	14.509	7	23 43 49.21	2.2922	3 47 36.8	15.046
8	21 55 11.36	2.3478	8 4 3.8	14.563	8	23 46 6.74	2.2922	4 2 38.6	15.013
9	21 57 32.16	2.3457	7 49 28.4	14.616	9	23 48 24.27	2.2923	4 17 38.3	14.978
10	21 59 52.84	2.3435	7 34 49.9	14.668	10	23 50 41.81	2.2923	4 32 36.0	14.943
11	22 2 13.38	2.3413	7 20 8.3	14.717	11	23 52 59.35	2.2924	4 47 31.4	14.904
12	22 4 33.80	2.3393	7 5 23.9	14.763	12	23 55 16.90	2.2926	5 2 24.5	14.865
13	22 6 54.10	2.3373	6 50 36.7	14.808	13	23 57 34.46	2.2928	5 17 15.2	14.823
14	22 9 14.27	2.3352	6 35 46.9	14.852	14	23 59 52.04	2.2932	5 32 3.3	14.780
15	22 11 34.32	2.3333	6 20 54.5	14.893	15	0 2 9.64	2.2935	5 46 48.8	14.738
16	22 13 54.26	2.3313	6 5 59.7	14.933	16	0 4 27.26	2.2938	-6 1 31.6	14.690
17	22 16 14.08	2.3294	5 51 2.5	14.972	17	0 6 44.90	2.2943	6 16 11.6	14.643
18	22 18 33.79	2.3276	5 36 3.1	15.008	18	0 9 2.58	2.2948	-6 30 48.7	14.593
19	22 20 53.39	2.3258	5 21 1.6	15.041	19	0 11 20.28	2.2953	6 45 22.7	14.542
20	22 23 12.89	2.3240	5 5 58.2	15.073	20	0 13 38.01	2.2958	6 59 53.7	14.489
21	22 25 32.27	2.3223	4 50 52.8	15.105	21	0 15 55.78	2.2964	7 14 21.4	14.435
22	22 27 51.56	2.3206	4 35 45.6	15.133	22	0 18 13.58	2.2971	7 28 45.9	14.379
23	22 30 10.74	2.3189	4 20 36.8	15.159	23	0 20 31.43	2.2978	7 43 6.9	14.322
24	22 32 29.83	2.3173	-4 5 26.5	+15.183	24	0 22 49.32	2.2985	+7 57 24.5	+14.263

GREENWICH MEAN TIME.

sur.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.					
FEBRUARY 14.							FEBRUARY 16.											
	h	m	s	s	°	'	''		h	m	s	s	°	'	''	''		
0	0	22	49.32	2.2985	+	7	57	24.5	+12.463	0	2	14	35.14	2.3651	+17	47	51.4	+9.868
1	0	25	7.25	2.2993		8	11	38.5	14.203	1	2	16	57.09	2.3667	17	57	39.9	9.748
2	0	27	25.24	2.3002		8	25	48.9	14.141	2	2	19	19.14	2.3683	18	7	21.2	9.629
3	0	29	43.27	2.3009		8	39	55.4	14.078	3	2	21	41.28	2.3698	18	16	55.4	9.509
4	0	32	1.35	2.3018		8	53	58.2	14.013	4	2	24	3.51	2.3713	18	26	22.3	9.381
5	0	34	19.49	2.3028		9	7	56.9	13.946	5	2	26	25.83	2.3728	18	35	41.9	9.265
6	0	36	37.69	2.3038		9	21	51.7	13.879	6	2	28	48.24	2.3743	18	44	54.1	9.142
7	0	38	55.95	2.3048		9	35	42.4	13.809	7	2	31	10.74	2.3757	18	53	58.9	9.018
8	0	41	14.27	2.3058		9	49	28.8	13.738	8	2	33	33.32	2.3771	19	2	56.3	8.895
9	0	43	32.65	2.3069		10	3	10.9	13.666	9	2	35	55.99	2.3785	19	11	46.3	8.769
0	0	45	51.10	2.3080		10	16	48.7	13.593	10	2	38	18.74	2.3799	19	20	28.6	8.643
1	0	48	9.61	2.3092		10	30	22.0	13.518	11	2	40	41.58	2.3813	19	29	3.4	8.517
2	0	50	28.20	2.3104		10	43	50.8	13.441	12	2	43	4.49	2.3826	19	37	30.6	8.389
3	0	52	46.86	2.3116		10	57	14.9	13.363	13	2	45	27.49	2.3839	19	45	50.1	8.261
4	0	55	5.59	2.3128		11	10	34.4	13.284	14	2	47	50.56	2.3851	19	54	1.9	8.133
5	0	57	24.39	2.3141		11	23	49.0	13.203	15	2	50	13.70	2.3863	20	2	6.0	8.003
6	0	59	43.28	2.3154		11	36	58.8	13.122	16	2	52	36.92	2.3876	20	10	2.3	7.873
7	1	2	2.24	2.3167		11	50	3.6	13.038	17	2	55	0.21	2.3887	20	17	50.8	7.743
8	1	4	21.28	2.3180		12	3	3.3	12.963	18	2	57	23.56	2.3898	20	25	31.5	7.612
9	1	6	40.40	2.3194		12	15	58.0	12.888	19	2	59	46.98	2.3908	20	33	4.2	7.479
0	1	8	59.61	2.3208		12	28	47.5	12.781	20	3	2	10.46	2.3919	20	40	29.0	7.348
1	1	11	18.90	2.3223		12	41	31.7	12.692	21	3	4	34.01	2.3929	20	47	45.9	7.216
2	1	13	38.28	2.3238		12	54	10.5	12.603	22	3	6	57.61	2.3938	20	54	54.9	7.083
3	1	15	57.75	2.3252	+	13	6	44.0	+12.512	23	3	9	21.27	2.3948	+21	1	55.8	+6.948
FEBRUARY 15.							FEBRUARY 17.											
0	1	18	17.30	2.3266	+	13	19	11.9	+12.419	0	3	11	44.98	2.3956	+21	8	48.6	+6.813
1	1	20	36.94	2.3282		13	31	34.3	12.326	1	3	14	8.74	2.3965	21	15	33.4	6.679
2	1	22	56.68	2.3297		13	43	51.0	12.230	2	3	16	32.56	2.3973	21	22	10.1	6.544
3	1	25	16.50	2.3312		13	56	1.9	12.134	3	3	18	56.41	2.3979	21	28	38.7	6.408
4	1	27	36.42	2.3328		14	8	7.1	12.038	4	3	21	20.31	2.3987	21	34	59.1	6.272
5	1	29	56.44	2.3344		14	20	6.4	11.939	5	3	23	44.25	2.3993	21	41	11.3	6.136
6	1	32	16.55	2.3359		14	31	59.8	11.840	6	3	26	8.22	2.3998	21	47	15.4	5.999
7	1	34	36.75	2.3375		14	43	47.2	11.739	7	3	28	32.23	2.4003	21	53	11.2	5.862
8	1	36	57.05	2.3392		14	55	28.5	11.638	8	3	30	56.26	2.4008	21	58	58.8	5.725
9	1	39	17.45	2.3408		15	7	3.7	11.535	9	3	33	20.33	2.4013	22	4	38.2	5.588
0	1	41	37.95	2.3424		15	18	32.7	11.430	10	3	35	44.41	2.4015	22	10	9.3	5.448
1	1	43	58.54	2.3440		15	29	55.3	11.325	11	3	38	8.51	2.4018	22	15	32.0	5.310
2	1	46	19.23	2.3457		15	41	11.7	11.230	12	3	40	32.63	2.4021	22	20	46.5	5.173
3	1	48	40.02	2.3473		15	52	21.7	11.113	13	3	42	56.76	2.4023	22	25	52.7	5.033
4	1	51	0.90	2.3489		16	3	25.2	11.003	14	3	45	20.90	2.4023	22	30	50.5	4.893
5	1	53	21.89	2.3506		16	14	22.1	10.894	15	3	47	45.04	2.4024	22	35	39.9	4.754
6	1	55	42.97	2.3522		16	25	12.5	10.784	16	3	50	9.19	2.4024	22	40	21.0	4.615
7	1	58	4.15	2.3538		16	35	56.2	10.673	17	3	52	33.33	2.4023	22	44	53.7	4.475
8	2	0	25.42	2.3554		16	46	33.3	10.561	18	3	54	57.47	2.4023	22	49	18.0	4.336
9	2	2	46.80	2.3572		16	57	3.5	10.448	19	3	57	21.60	2.4020	22	53	34.0	4.196
0	2	5	8.28	2.3588		17	7	27.0	10.333	20	3	59	45.71	2.4017	22	57	41.5	4.056
1	2	7	29.85	2.3603		17	17	43.5	10.218	21	4	2	9.80	2.4014	23	1	40.7	3.916
2	2	9	51.52	2.3619		17	27	53.2	10.103	22	4	4	33.88	2.4010	23	5	31.4	3.775
3	2	12	13.28	2.3635		17	37	55.8	9.985	23	4	6	57.92	2.4005	23	9	13.7	3.635
4	2	14	35.14	2.3651	+	17	47	51.4	+ 9.868	24	4	9	21.94	2.4001	+23	12	47.6	+3.499

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.		
FEBRUARY 18.							FEBRUARY 20.								
	h	m	s	s	°	'	°	h	m	s	s	°	'	°	
0	4	9	21.94	2.4001	+23	12 47.6	+3.495	0	6	2	39.35	2.2953	+23	22 7.6	-2.963
1	4	11	45.93	2.3994	23	16 13.1	3.354	1	6	4	56.96	2.2917	23	19 6.2	3.085
2	4	14	9.87	2.3988	23	19 30.1	3.213	2	6	7	14.35	2.2880	23	15 57.4	3.208
3	4	16	33.78	2.3981	23	22 38.7	3.073	3	6	9	31.52	2.2843	23	12 41.3	3.323
4	4	18	57.64	2.3973	23	25 38.9	2.933	4	6	11	48.46	2.2805	23	9 18.0	3.448
5	4	21	21.45	2.3963	23	28 30.6	2.793	5	6	14	5.18	2.2767	23	5 47.5	3.568
6	4	23	45.20	2.3954	23	31 14.0	2.653	6	6	16	21.66	2.2728	23	2 9.8	3.688
7	4	26	8.90	2.3945	23	33 48.9	2.512	7	6	18	37.91	2.2688	22	58 25.0	3.806
8	4	28	32.54	2.3933	23	36 15.4	2.372	8	6	20	53.92	2.2649	22	54 33.1	3.923
9	4	30	56.10	2.3922	23	38 33.5	2.233	9	6	23	9.70	2.2610	22	50 34.3	4.039
10	4	33	19.60	2.3910	23	40 43.3	2.093	10	6	25	25.24	2.2569	22	46 28.4	4.156
11	4	35	43.02	2.3897	23	42 44.6	1.952	11	6	27	40.53	2.2528	22	42 15.6	4.270
12	4	38	6.36	2.3883	23	44 37.5	1.813	12	6	29	55.58	2.2488	22	37 56.0	4.384
13	4	40	29.62	2.3869	23	46 22.1	1.673	13	6	32	10.39	2.2447	22	33 29.5	4.498
14	4	42	52.79	2.3853	23	47 58.3	1.534	14	6	34	24.94	2.2405	22	28 56.2	4.611
15	4	45	15.86	2.3838	23	49 26.2	1.396	15	6	36	39.25	2.2363	22	24 16.2	4.723
16	4	47	38.84	2.3822	23	50 45.8	1.257	16	6	38	53.30	2.2321	22	19 29.4	4.834
17	4	50	1.72	2.3805	23	51 57.0	1.118	17	6	41	7.10	2.2279	22	14 36.1	4.944
18	4	52	24.50	2.3787	23	53 0.0	0.981	18	6	43	20.65	2.2237	22	9 36.1	5.054
19	4	54	47.16	2.3768	23	53 54.7	0.843	19	6	45	33.94	2.2193	22	4 29.6	5.163
20	4	57	9.71	2.3749	23	54 41.1	0.705	20	6	47	46.97	2.2150	21	59 16.6	5.271
21	4	59	32.15	2.3729	23	55 19.3	0.568	21	6	49	59.74	2.2107	21	53 57.1	5.378
22	5	1	54.46	2.3708	23	55 49.2	0.431	22	6	52	12.25	2.2063	21	48 31.2	5.484
23	5	4	16.65	2.3688	+23	56 11.0	+0.295	23	6	54	24.50	2.2019	+21	42 59.0	-5.589
FEBRUARY 19.							FEBRUARY 21.								
0	5	6	38.71	2.3666	+23	56 24.6	+0.158	0	6	56	36.48	2.1975	+21	37 20.5	-5.693
1	5	9	0.64	2.3643	23	56 30.0	+0.023	1	6	58	48.20	2.1932	21	31 35.8	5.798
2	5	11	22.43	2.3619	23	56 27.3	-0.113	2	7	0	59.66	2.1888	21	25 44.8	5.901
3	5	13	44.07	2.3595	23	56 16.5	0.248	3	7	3	10.85	2.1843	21	19 47.7	6.002
4	5	16	5.57	2.3572	23	55 57.6	0.383	4	7	5	21.77	2.1798	21	13 44.6	6.103
5	5	18	26.93	2.3547	23	55 30.6	0.517	5	7	7	32.43	2.1753	21	7 35.3	6.204
6	5	20	48.13	2.3520	23	54 55.6	0.650	6	7	9	42.81	2.1708	21	1 20.1	6.303
7	5	23	9.17	2.3493	23	54 12.6	0.783	7	7	11	52.93	2.1664	20	54 59.0	6.401
8	5	25	30.05	2.3467	23	53 21.7	0.916	8	7	14	2.78	2.1619	20	48 32.0	6.498
9	5	27	50.77	2.3439	23	52 22.7	1.048	9	7	16	12.36	2.1574	20	41 59.2	6.595
10	5	30	11.32	2.3410	23	51 15.9	1.179	10	7	18	21.67	2.1528	20	35 20.6	6.691
11	5	32	31.69	2.3381	23	50 1.2	1.311	11	7	20	30.70	2.1483	20	28 36.3	6.786
12	5	34	51.89	2.3352	23	48 38.6	1.442	12	7	22	39.47	2.1439	20	21 46.3	6.880
13	5	37	11.91	2.3322	23	47 8.2	1.572	13	7	24	47.97	2.1393	20	14 50.7	6.973
14	5	39	31.75	2.3291	23	45 30.0	1.701	14	7	26	56.19	2.1348	20	7 49.6	7.065
15	5	41	51.40	2.3259	23	43 44.1	1.830	15	7	29	4.15	2.1303	20	0 42.9	7.157
16	5	44	10.86	2.3228	23	41 50.4	1.958	16	7	31	11.83	2.1258	19	53 30.8	7.247
17	5	46	30.14	2.3196	23	39 49.1	2.086	17	7	33	19.24	2.1213	19	46 13.3	7.337
18	5	48	49.21	2.3162	23	37 40.1	2.213	18	7	35	26.38	2.1168	19	38 50.4	7.425
19	5	51	8.08	2.3128	23	35 23.5	2.340	19	7	37	33.25	2.1123	19	31 22.3	7.513
20	5	53	26.75	2.3095	23	32 59.3	2.466	20	7	39	39.85	2.1078	19	23 48.9	7.599
21	5	55	45.22	2.3060	23	30 27.6	2.591	21	7	41	46.18	2.1033	19	16 10.4	7.685
22	5	58	3.47	2.3025	23	27 48.4	2.716	22	7	43	52.24	2.0988	19	8 26.7	7.770
23	6	0	21.52	2.2990	23	25 1.7	2.840	23	7	45	58.03	2.0943	19	0 38.0	7.854
24	6	2	39.35	2.2953	+23	22 7.6	-2.963	24	7	48	3.55	2.0898	+18	52 41.2	-7.933

GREENWICH MEAN TIME.

Right ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 22.				FEBRUARY 24.				
m s	s	° ' "	"		h m s	s	° ' "	"
48 3.55	2.0898	+18 52 44.2	-7.938	0	9 23 36.78	1.9032	+11 12 53.1	-10.888
50 8.80	2.0853	18 44 45.5	8.019	1	9 25 30.88	1.9001	11 1 58.6	10.929
52 13.79	2.0809	18 36 41.9	8.101	2	9 27 24.79	1.8971	10 51 1.7	10.968
54 18.51	2.0764	18 28 33.4	8.182	3	9 29 18.53	1.8942	10 40 2.4	11.008
56 22.96	2.0720	18 20 20.1	8.261	4	9 31 12.09	1.8913	10 29 0.8	11.045
58 27.15	2.0677	18 12 2.1	8.340	5	9 33 5.48	1.8884	10 17 57.0	11.083
0 31.08	2.0633	18 3 39.3	8.418	6	9 34 58.70	1.8856	10 6 50.9	11.120
2 34.74	2.0588	17 55 12.0	8.494	7	9 36 51.75	1.8828	9 55 42.6	11.155
4 38.14	2.0545	17 46 40.0	8.571	8	9 38 44.64	1.8801	9 44 32.3	11.189
6 41.28	2.0501	17 38 3.5	8.646	9	9 40 37.36	1.8774	9 33 19.9	11.224
8 44.16	2.0458	17 29 22.5	8.719	10	9 42 29.93	1.8748	9 22 5.4	11.258
10 46.78	2.0415	17 20 37.2	8.793	11	9 44 22.34	1.8722	9 10 49.0	11.290
12 49.14	2.0373	17 11 47.4	8.866	12	9 46 14.59	1.8696	8 59 30.6	11.322
14 51.25	2.0330	17 2 53.3	8.937	13	9 48 6.69	1.8672	8 48 10.4	11.353
16 53.10	2.0288	16 53 55.0	9.007	14	9 49 58.65	1.8648	8 36 48.3	11.383
18 54.70	2.0245	16 44 52.5	9.077	15	9 51 50.46	1.8623	8 25 24.4	11.413
20 56.04	2.0203	16 35 45.8	9.146	16	9 53 42.13	1.8600	8 13 58.8	11.441
22 57.14	2.0162	16 26 35.0	9.214	17	9 55 33.66	1.8577	8 2 31.5	11.469
24 57.98	2.0120	16 17 20.1	9.281	18	9 57 25.05	1.8554	7 51 2.5	11.497
26 58.58	2.0080	16 8 1.3	9.347	19	9 59 16.31	1.8533	7 39 31.9	11.523
28 58.94	2.0038	15 58 38.5	9.413	20	10 1 7.44	1.8510	7 27 59.8	11.548
30 59.04	1.9998	15 49 11.8	9.477	21	10 2 58.43	1.8488	7 16 26.1	11.573
32 58.91	1.9958	15 39 41.3	9.540	22	10 4 49.30	1.8468	7 4 51.0	11.598
34 58.53	1.9918	+15 30 7.0	-9.603	23	10 6 40.05	1.8448	+6 53 14.4	-11.621
FEBRUARY 23.				FEBRUARY 25.				
36 57.92	1.9878	+15 20 29.0	-9.664	0	10 8 30.68	1.8428	+6 41 36.5	-11.643
38 57.07	1.9838	15 10 47.3	9.725	1	10 10 21.19	1.8409	6 29 57.2	11.665
40 55.98	1.9799	15 1 2.0	9.784	2	10 12 11.59	1.8391	6 18 16.7	11.686
42 54.66	1.9761	14 51 13.2	9.843	3	10 14 1.88	1.8373	6 6 34.9	11.707
44 53.11	1.9722	14 41 20.8	9.903	4	10 15 52.06	1.8354	5 54 51.9	11.726
46 51.32	1.9684	14 31 24.9	9.959	5	10 17 42.13	1.8338	5 43 7.8	11.745
48 49.32	1.9647	14 21 25.7	10.016	6	10 19 32.11	1.8321	5 31 22.5	11.763
50 47.08	1.9609	14 11 23.0	10.072	7	10 21 21.98	1.8304	5 19 36.2	11.781
52 44.63	1.9573	14 1 17.1	10.126	8	10 23 11.76	1.8289	5 7 48.8	11.798
54 41.95	1.9535	13 51 7.9	10.180	9	10 25 1.45	1.8273	4 56 0.5	11.813
56 39.05	1.9499	13 40 55.5	10.233	10	10 26 51.04	1.8258	4 44 11.3	11.828
58 35.94	1.9463	13 30 39.9	10.286	11	10 28 40.55	1.8245	4 32 21.1	11.843
0 32.61	1.9428	13 20 21.2	10.337	12	10 30 29.98	1.8232	4 20 30.1	11.857
2 29.07	1.9393	13 9 59.5	10.387	13	10 32 19.33	1.8218	4 8 38.3	11.869
4 25.32	1.9358	12 59 34.8	10.437	14	10 34 8.59	1.8204	3 56 45.8	11.883
6 21.36	1.9323	12 49 7.1	10.486	15	10 35 57.78	1.8193	3 44 52.5	11.893
8 17.19	1.9289	12 38 36.5	10.534	16	10 37 46.91	1.8182	3 32 58.6	11.904
10 12.83	1.9256	12 28 3.0	10.581	17	10 39 35.96	1.8169	3 21 4.0	11.915
12 8.26	1.9222	12 17 26.8	10.627	18	10 41 24.94	1.8159	3 9 8.8	11.924
14 3.49	1.9189	12 6 47.8	10.673	19	10 43 13.87	1.8149	2 57 13.1	11.933
15 58.53	1.9158	11 56 6.0	10.718	20	10 45 2.73	1.8139	2 45 16.9	11.941
17 53.38	1.9125	11 45 21.7	10.761	21	10 46 51.54	1.8130	2 33 20.2	11.948
19 48.03	1.9093	11 34 34.7	10.805	22	10 48 40.29	1.8122	2 21 23.1	11.955
21 42.50	1.9063	11 23 45.1	10.847	23	10 50 29.00	1.8113	2 9 25.6	11.961
23 36.78	1.9032	+11 12 53.1	-10.888	24	10 52 17.65	1.8105	+1 57 27.8	-11.966

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 26.					FEBRUARY 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 52 17.65	1.8105	+1 57 27.8	-11.966	0	12 19 18.22	1.8346	-7 29 43.1	-11.404
1	10 54 6.26	1.8098	1 45 29.7	11.970	1	12 21 8.35	1.8363	7 41 6.5	11.375
2	10 55 54.83	1.8093	1 33 31.4	11.973	2	12 22 58.58	1.8381	7 52 28.1	11.346
3	10 57 43.37	1.8086	1 21 32.9	11.977	3	12 24 48.92	1.8400	8 3 48.0	11.317
4	10 59 31.86	1.8080	1 9 34.2	11.979	4	12 26 39.38	1.8419	8 15 6.1	11.286
5	11 1 20.33	1.8075	0 57 35.4	11.981	5	12 28 29.95	1.8438	8 26 22.3	11.254
6	11 3 8.76	1.8071	0 45 36.5	11.983	6	12 30 20.64	1.8458	8 37 36.6	11.223
7	11 4 57.18	1.8068	0 33 37.5	11.983	7	12 32 11.45	1.8478	8 48 49.0	11.190
8	11 6 45.57	1.8063	0 21 38.6	11.982	8	12 34 2.38	1.8499	8 59 59.4	11.157
9	11 8 33.94	1.8060	+0 9 39.7	11.981	9	12 35 53.44	1.8521	9 11 7.8	11.123
10	11 10 22.29	1.8058	-0 2 19.1	11.979	10	12 37 44.63	1.8543	9 22 14.1	11.088
11	11 12 10.63	1.8056	0 14 17.8	11.977	11	12 39 35.96	1.8566	9 33 18.3	11.052
12	11 13 58.96	1.8054	0 26 16.3	11.973	12	12 41 27.42	1.8588	9 44 20.3	11.015
13	11 15 47.28	1.8053	0 38 14.6	11.969	13	12 43 19.02	1.8612	9 55 20.1	10.979
14	11 17 35.60	1.8053	0 50 12.6	11.965	14	12 45 10.76	1.8635	10 6 17.8	10.942
15	11 19 23.92	1.8053	1 2 10.4	11.960	15	12 47 2.64	1.8660	10 17 13.1	10.903
16	11 21 12.24	1.8054	1 14 7.8	11.954	16	12 48 54.68	1.8685	10 28 6.1	10.864
17	11 23 0.57	1.8055	1 26 4.9	11.948	17	12 50 46.86	1.8709	10 38 56.8	10.824
18	11 24 48.90	1.8057	1 38 1.5	11.940	18	12 52 39.19	1.8735	10 49 45.0	10.783
19	11 26 37.25	1.8059	1 49 57.7	11.932	19	12 54 31.68	1.8762	11 0 30.8	10.743
20	11 28 25.61	1.8062	2 1 53.3	11.923	20	12 56 24.33	1.8788	11 11 14.1	10.701
21	11 30 13.99	1.8065	2 13 48.5	11.914	21	12 58 17.14	1.8815	11 21 54.9	10.659
22	11 32 2.39	1.8068	2 25 43.0	11.904	22	13 0 10.11	1.8843	11 32 33.2	10.616
23	11 33 50.81	1.8073	-2 37 37.0	-11.893	23	13 2 3.25	1.8871	-11 43 8.8	-10.571
FEBRUARY 27.					MARCH 1.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 35 39.26	1.8078	-2 49 30.2	-11.882	0	13 3 56.56	1.8899	-11 53 41.7	-10.526
1	11 37 27.74	1.8083	3 1 22.8	11.870	1	13 5 50.04	1.8928	12 4 11.9	10.481
2	11 39 16.26	1.8089	3 13 14.6	11.857	2	13 7 43.70	1.8958	12 14 39.4	10.435
3	11 41 4.81	1.8095	3 25 5.6	11.843	3	13 9 37.54	1.8988	12 25 4.1	10.388
4	11 42 53.40	1.8102	3 36 55.8	11.829	4	13 11 31.55	1.9018	12 35 25.9	10.340
5	11 44 42.03	1.8109	3 48 45.1	11.815	5	13 13 25.75	1.9048	12 45 44.9	10.292
6	11 46 30.71	1.8118	4 0 33.6	11.799	6	13 15 20.13	1.9079	12 56 0.9	10.243
7	11 48 19.44	1.8126	4 12 21.0	11.783	7	13 17 14.70	1.9111	13 6 14.0	10.193
8	11 50 8.22	1.8134	4 24 7.5	11.767	8	13 19 9.46	1.9143	13 16 24.0	10.142
9	11 51 57.05	1.8143	4 35 53.0	11.748	9	13 21 4.42	1.9176	13 26 31.0	10.091
10	11 53 45.94	1.8154	4 47 37.3	11.730	10	13 22 59.57	1.9208	13 36 34.9	10.038
11	11 55 34.90	1.8164	4 59 20.6	11.712	11	13 24 54.91	1.9241	13 46 35.6	9.985
12	11 57 23.91	1.8174	5 11 2.7	11.692	12	13 26 50.46	1.9275	13 56 33.1	9.932
13	11 59 12.99	1.8187	5 22 43.6	11.672	13	13 28 46.21	1.9309	14 6 27.4	9.878
14	12 1 2.15	1.8199	5 34 23.3	11.651	14	13 30 42.17	1.9343	14 16 18.4	9.822
15	12 2 51.38	1.8211	5 46 1.7	11.629	15	13 32 38.33	1.9378	14 26 6.0	9.766
16	12 4 40.68	1.8223	5 57 38.8	11.607	16	13 34 34.71	1.9413	14 35 50.3	9.710
17	12 6 30.06	1.8238	6 9 14.5	11.583	17	13 36 31.29	1.9448	14 45 31.2	9.653
18	12 8 19.53	1.8252	6 20 48.8	11.560	18	13 38 28.09	1.9485	14 55 8.6	9.593
19	12 10 9.08	1.8266	6 32 21.7	11.536	19	13 40 25.11	1.9522	15 4 42.4	9.534
20	12 11 58.72	1.8281	6 43 53.1	11.511	20	13 42 22.35	1.9558	15 14 12.7	9.475
21	12 13 48.45	1.8297	6 55 23.0	11.485	21	13 44 19.81	1.9596	15 23 39.4	9.415
22	12 15 38.28	1.8313	7 6 51.3	11.458	22	13 46 17.50	1.9633	15 33 2.5	9.353
23	12 17 28.20	1.8328	7 18 18.0	11.432	23	13 48 15.40	1.9670	15 42 21.8	9.291
24	12 19 18.22	1.8346	-7 29 43.1	-11.404	24	13 50 13.54	1.9709	-15 51 37.4	-9.223

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 2.					MARCH 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 50 13.54	1.9709	-15 51 37.4	-0.228	0	15 29 43.63	2.1811	-21 46 47.9	-5.253
1	13 52 11.91	1.9748	16 0 49.2	9.165	1	15 31 54.63	2.1857	21 52 0.0	5.149
2	13 54 10.51	1.9786	16 9 57.2	9.100	2	15 34 5.91	2.1903	21 57 5.8	5.044
3	13 56 9.34	1.9825	16 19 1.2	9.035	3	15 36 17.46	2.1948	22 2 5.3	4.940
4	13 58 8.41	1.9865	16 28 1.4	8.969	4	15 38 29.28	2.1993	22 6 58.6	4.835
5	14 0 7.72	1.9905	16 36 57.5	8.903	5	15 40 41.38	2.2038	22 11 45.5	4.728
6	14 2 7.27	1.9945	16 45 49.7	8.835	6	15 42 53.74	2.2083	22 16 25.9	4.620
7	14 4 7.06	1.9986	16 54 37.7	8.766	7	15 45 6.37	2.2128	22 20 59.9	4.513
8	14 6 7.10	2.0027	17 3 21.6	8.698	8	15 47 19.27	2.2173	22 25 27.4	4.403
9	14 8 7.38	2.0068	17 12 1.4	8.628	9	15 49 32.44	2.2217	22 29 48.3	4.293
10	14 10 7.91	2.0108	17 20 36.9	8.556	10	15 51 45.87	2.2261	22 34 2.6	4.183
11	14 12 8.68	2.0150	17 29 8.1	8.484	11	15 53 59.57	2.2305	22 38 10.3	4.072
12	14 14 9.71	2.0193	17 37 35.0	8.412	12	15 56 13.53	2.2348	22 42 11.2	3.959
13	14 16 10.99	2.0234	17 45 57.5	8.339	13	15 58 27.75	2.2392	22 46 5.4	3.847
14	14 18 12.52	2.0277	17 54 15.7	8.265	14	16 0 42.23	2.2436	22 49 52.8	3.733
15	14 20 14.31	2.0320	18 2 29.3	8.190	15	16 2 56.98	2.2479	22 53 33.3	3.618
16	14 22 16.36	2.0363	18 10 38.5	8.114	16	16 5 11.98	2.2521	22 57 7.0	3.503
17	14 24 18.66	2.0406	18 18 43.0	8.038	17	16 7 27.23	2.2563	23 0 33.7	3.387
18	14 26 21.23	2.0449	18 26 43.0	7.961	18	16 9 42.74	2.2605	23 3 53.4	3.269
19	14 28 24.05	2.0493	18 34 38.3	7.883	19	16 11 58.49	2.2647	23 7 6.0	3.152
20	14 30 27.14	2.0537	18 42 28.9	7.803	20	16 14 14.50	2.2688	23 10 11.6	3.034
21	14 32 30.49	2.0581	18 50 14.7	7.723	21	16 16 30.76	2.2729	23 13 10.1	2.915
22	14 34 34.11	2.0625	18 57 55.7	7.643	22	16 18 47.26	2.2770	23 16 1.4	2.795
23	14 36 37.99	2.0669	-19 5 31.9	-7.562	23	16 21 4.00	2.2811	-23 18 45.5	-2.674
MARCH 3.					MARCH 5.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 38 42.14	2.0714	-19 13 3.1	-7.479	0	16 23 20.99	2.2852	-23 21 22.3	-2.553
1	14 40 46.56	2.0758	19 20 29.4	7.396	1	16 25 38.22	2.2891	23 23 51.8	2.431
2	14 42 51.24	2.0803	19 27 50.6	7.312	2	16 27 55.68	2.2929	23 26 14.0	2.309
3	14 44 56.20	2.0849	19 35 6.8	7.228	3	16 30 13.37	2.2968	23 28 28.9	2.186
4	14 47 1.43	2.0894	19 42 17.9	7.142	4	16 32 31.30	2.3007	23 30 36.3	2.061
5	14 49 6.93	2.0938	19 49 23.8	7.055	5	16 34 49.45	2.3044	23 32 36.2	1.936
6	14 51 12.69	2.0984	19 56 24.5	6.968	6	16 37 7.83	2.3083	23 34 28.6	1.811
7	14 53 18.74	2.1031	20 3 19.9	6.879	7	16 39 26.44	2.3119	23 36 13.5	1.685
8	14 55 25.06	2.1076	20 10 10.0	6.791	8	16 41 45.26	2.3156	23 37 50.8	1.558
9	14 57 31.65	2.1122	20 16 54.8	6.701	9	16 44 4.31	2.3192	23 39 20.5	1.431
10	14 59 38.52	2.1168	20 23 34.1	6.610	10	16 46 23.56	2.3226	23 40 42.5	1.303
11	15 1 45.66	2.1213	20 30 8.0	6.518	11	16 48 43.03	2.3263	23 41 56.8	1.174
12	15 3 53.08	2.1260	20 36 36.3	6.426	12	16 51 2.71	2.3297	23 43 3.4	1.045
13	15 6 0.78	2.1306	20 42 59.1	6.333	13	16 53 22.59	2.3330	23 44 2.2	0.915
14	15 8 8.75	2.1351	20 49 16.3	6.239	14	16 55 42.67	2.3364	23 44 53.2	0.785
15	15 10 16.99	2.1397	20 55 27.8	6.144	15	16 58 2.96	2.3398	23 45 36.4	0.653
16	15 12 25.51	2.1443	21 1 33.6	6.048	16	17 0 23.44	2.3428	23 46 11.6	0.522
17	15 14 34.31	2.1490	21 7 33.6	5.952	17	17 2 44.10	2.3460	23 46 39.0	0.390
18	15 16 43.39	2.1536	21 13 27.8	5.854	18	17 5 4.96	2.3493	23 46 58.4	0.257
19	15 18 52.74	2.1582	21 19 16.1	5.756	19	17 7 26.01	2.3523	23 47 9.8	-0.124
20	15 21 2.37	2.1628	21 24 58.5	5.657	20	17 9 47.23	2.3553	23 47 13.3	+0.010
21	15 23 12.27	2.1673	21 30 34.9	5.558	21	17 12 8.64	2.3583	23 47 8.6	0.144
22	15 25 22.45	2.1719	21 36 5.4	5.457	22	17 14 30.22	2.3610	23 46 56.0	0.278
23	15 27 32.90	2.1765	21 41 29.7	5.354	23	17 16 51.96	2.3638	23 46 35.2	0.414
24	15 29 43.63	2.1811	-21 46 47.9	-5.253	24	17 19 13.88	2.3667	-23 46 6.3	+0.550

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 6.					MARCH 8.				
0	17 19 13.88	2.3667	-23 46 6.3	+0.550	0	19 14 44.19	2.4207	-20 38 39.3	+7.270
1	17 21 35.96	2.3693	23 45 29.2	0.686	1	19 17 9.42	2.4203	20 31 19.0	7.407
2	17 23 58.20	2.3719	23 44 44.0	0.822	2	19 19 34.63	2.4199	20 23 50.5	7.543
3	17 26 20.59	2.3745	23 43 50.6	0.959	3	19 21 59.81	2.4194	20 16 13.9	7.678
4	17 28 43.14	2.3770	23 42 48.9	1.097	4	19 24 24.96	2.4188	20 8 29.1	7.813
5	17 31 5.83	2.3794	23 41 39.0	1.234	5	19 26 50.07	2.4182	20 0 36.3	7.947
6	17 33 28.67	2.3818	23 40 20.8	1.373	6	19 29 15.14	2.4176	19 52 35.5	8.081
7	17 35 51.65	2.3841	23 38 54.3	1.511	7	19 31 40.18	2.4169	19 44 26.6	8.215
8	17 38 14.76	2.3863	23 37 19.5	1.650	8	19 34 5.17	2.4162	19 36 9.7	8.348
9	17 40 38.01	2.3885	23 35 36.3	1.789	9	19 36 30.12	2.4154	19 27 44.9	8.479
10	17 43 1.38	2.3906	23 33 44.8	1.928	10	19 38 55.02	2.4146	19 19 12.2	8.610
11	17 45 24.88	2.3927	23 31 45.0	2.068	11	19 41 19.87	2.4138	19 10 31.7	8.741
12	17 47 48.50	2.3947	23 29 36.7	2.208	12	19 43 44.67	2.4129	19 1 43.3	8.872
13	17 50 12.24	2.3965	23 27 20.0	2.348	13	19 46 9.42	2.4119	18 52 47.1	9.000
14	17 52 36.08	2.3983	23 24 54.9	2.488	14	19 48 34.10	2.4109	18 43 43.3	9.128
15	17 55 0.04	2.4002	23 22 21.4	2.629	15	19 50 58.73	2.4100	18 34 31.7	9.258
16	17 57 24.10	2.4018	23 19 39.4	2.770	16	19 53 23.30	2.4089	18 25 12.4	9.384
17	17 59 48.25	2.4034	23 16 49.0	2.911	17	19 55 47.80	2.4078	18 15 45.6	9.509
18	18 2 12.51	2.4050	23 13 50.1	3.053	18	19 58 12.24	2.4068	18 6 11.3	9.635
19	18 4 36.85	2.4064	23 10 42.6	3.194	19	20 0 36.62	2.4057	17 56 29.4	9.760
20	18 7 1.28	2.4078	23 7 26.8	3.335	20	20 3 0.92	2.4045	17 46 40.1	9.883
21	18 9 25.79	2.4092	23 4 2.4	3.478	21	20 5 25.16	2.4033	17 36 43.5	10.006
22	18 11 50.38	2.4104	23 0 29.5	3.619	22	20 7 49.32	2.4021	17 26 39.4	10.128
23	18 14 15.04	2.4116	-22 56 48.1	+3.761	23	20 10 13.41	2.4009	-17 16 28.1	+10.248
MARCH 7.					MARCH 9.				
0	18 16 39.77	2.4128	-22 52 58.2	+3.903	0	20 12 37.43	2.3997	-17 6 9.6	+10.368
1	18 19 4.57	2.4139	22 48 59.8	4.044	1	20 15 1.37	2.3984	16 55 43.9	10.488
2	18 21 29.44	2.4149	22 44 52.9	4.186	2	20 17 25.24	2.3972	16 45 11.1	10.605
3	18 23 54.36	2.4158	22 40 37.5	4.328	3	20 19 49.03	2.3958	16 34 31.3	10.722
4	18 26 19.33	2.4167	22 36 13.5	4.470	4	20 22 12.74	2.3944	16 23 44.5	10.838
5	18 28 44.36	2.4175	22 31 41.1	4.612	5	20 24 36.36	2.3931	16 12 50.8	10.953
6	18 31 9.43	2.4182	22 27 0.1	4.754	6	20 26 59.91	2.3918	16 1 50.2	11.067
7	18 33 34.54	2.4188	22 22 10.6	4.895	7	20 29 23.38	2.3905	15 50 42.8	11.179
8	18 35 59.69	2.4195	22 17 12.7	5.037	8	20 31 46.77	2.3891	15 39 28.7	11.291
9	18 38 24.88	2.4200	22 12 6.2	5.178	9	20 34 10.07	2.3877	15 28 7.9	11.401
10	18 40 50.09	2.4204	22 6 51.3	5.319	10	20 36 33.29	2.3863	15 16 40.6	11.510
11	18 43 15.33	2.4209	22 1 27.9	5.461	11	20 38 56.43	2.3849	15 5 6.7	11.619
12	18 45 40.60	2.4213	21 55 56.0	5.602	12	20 41 19.48	2.3835	14 53 26.3	11.726
13	18 48 5.88	2.4215	21 50 15.7	5.743	13	20 43 42.45	2.3821	14 41 39.6	11.831
14	18 50 31.18	2.4218	21 44 26.9	5.883	14	20 46 5.33	2.3807	14 29 46.6	11.936
15	18 52 56.49	2.4218	21 38 29.8	6.023	15	20 48 28.13	2.3793	14 17 47.3	12.039
16	18 55 21.80	2.4219	21 32 24.2	6.163	16	20 50 50.85	2.3779	14 5 41.9	12.141
17	18 57 47.12	2.4220	21 26 10.2	6.303	17	20 53 13.48	2.3764	13 53 30.4	12.243
18	19 0 12.44	2.4220	21 19 47.9	6.442	18	20 55 36.02	2.3750	13 41 12.9	12.341
19	19 2 37.76	2.4219	21 13 17.2	6.581	19	20 57 58.48	2.3737	13 28 49.5	12.438
20	19 5 3.07	2.4218	21 6 38.2	6.719	20	21 0 20.86	2.3723	13 16 20.3	12.536
21	19 7 28.38	2.4216	20 59 50.9	6.858	21	21 2 43.16	2.3709	13 3 45.2	12.633
22	19 9 53.66	2.4213	20 52 55.3	6.996	22	21 5 5.37	2.3695	12 51 4.5	12.725
23	19 12 18.94	2.4211	20 45 51.4	7.133	23	21 7 27.50	2.3681	12 38 18.2	12.818
24	19 14 44.19	2.4207	-20 38 39.3	+7.270	24	21 9 49.54	2.3668	-12 25 26.3	+12.910

GREENWICH MEAN TIME.

Right ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 10.				MARCH 12.				
m s	s	° ' "	"		h m s	s	° ' "	"
9 49.54	2.3668	-12 25 26.3	+12.910	0	23 2 18.78	2.3332	- 0 50 38.0	+15.378
12 11.51	2.3654	12 12 29.0	12.999	1	23 4 38.78	2.3334	0 35 15.1	15.384
14 33.39	2.3640	11 59 26.4	13.088	2	23 6 58.79	2.3337	0 19 51.9	15.390
16 55.19	2.3628	11 46 18.5	13.175	3	23 9 18.82	2.3340	- 0 4 28.3	15.393
19 16.92	2.3615	11 33 5.4	13.261	4	23 11 38.87	2.3344	+ 0 10 55.3	15.394
21 38.57	2.3602	11 19 47.2	13.344	5	23 13 58.95	2.3348	0 26 19.0	15.395
24 0.14	2.3589	11 6 24.1	13.427	6	23 16 19.05	2.3353	0 41 42.7	15.393
26 21.64	2.3577	10 52 56.0	13.508	7	23 18 39.19	2.3358	0 57 6.1	15.388
28 43.06	2.3564	10 39 23.1	13.588	8	23 20 59.35	2.3363	1 12 29.2	15.382
31 4.41	2.3552	10 25 45.5	13.665	9	23 23 19.55	2.3370	1 27 51.9	15.373
33 25.68	2.3540	10 12 3.3	13.742	10	23 25 39.79	2.3377	1 43 14.0	15.363
35 46.89	2.3528	9 58 16.5	13.818	11	23 28 0.07	2.3383	1 58 35.5	15.352
38 8.02	2.3517	9 44 25.2	13.891	12	23 30 20.39	2.3391	2 13 56.2	15.338
40 29.09	2.3506	9 30 29.6	13.962	13	23 32 40.76	2.3398	2 29 16.0	15.322
42 50.09	2.3495	9 16 29.8	14.032	14	23 35 1.17	2.3406	2 44 34.8	15.304
45 11.03	2.3484	9 2 25.8	14.101	15	23 37 21.63	2.3415	2 59 52.5	15.284
47 31.90	2.3474	8 48 17.7	14.168	16	23 39 42.15	2.3425	3 15 8.9	15.263
49 52.72	2.3464	8 34 5.7	14.232	17	23 42 2.73	2.3434	3 30 24.0	15.239
52 13.47	2.3453	8 19 49.9	14.296	18	23 44 23.36	2.3443	3 45 37.6	15.214
54 34.16	2.3444	8 5 30.2	14.358	19	23 46 44.05	2.3453	4 0 49.7	15.187
56 54.80	2.3436	7 51 7.0	14.418	20	23 49 4.80	2.3464	4 16 0.0	15.158
59 15.39	2.3427	7 36 40.1	14.477	21	23 51 25.62	2.3476	4 31 8.6	15.127
1 35.92	2.3418	7 22 9.8	14.533	22	23 53 46.51	2.3488	4 46 15.2	15.093
3 56.41	2.3410	- 7 7 36.1	+14.588	23	23 56 7.47	2.3499	+ 5 1 19.8	+15.058
MARCH 11.				MARCH 13.				
6 16.84	2.3402	- 6 52 59.2	+14.641	0	23 58 28.50	2.3511	+ 5 16 22.2	+15.022
8 37.23	2.3394	6 38 19.2	14.693	1	0 0 49.60	2.3524	5 31 22.4	14.983
10 57.57	2.3387	6 23 36.1	14.743	2	0 3 10.79	2.3538	5 46 20.1	14.942
13 17.87	2.3381	6 8 50.0	14.791	3	0 5 32.05	2.3550	6 1 15.4	14.900
15 38.14	2.3374	5 54 1.2	14.837	4	0 7 53.39	2.3564	6 16 8.1	14.856
17 58.36	2.3368	5 39 9.6	14.882	5	0 10 14.82	2.3578	6 30 58.1	14.810
20 18.55	2.3363	5 24 15.4	14.924	6	0 12 36.33	2.3593	6 45 45.3	14.762
22 38.71	2.3358	5 9 18.7	14.965	7	0 14 57.93	2.3608	7 0 29.5	14.712
24 58.84	2.3353	4 54 19.6	15.004	8	0 17 19.62	2.3623	7 15 10.7	14.660
27 18.94	2.3348	4 39 18.2	15.041	9	0 19 41.40	2.3638	7 29 48.7	14.606
29 39.01	2.3343	4 24 14.7	15.077	10	0 22 3.28	2.3654	7 44 23.4	14.551
31 59.06	2.3340	4 9 9.0	15.111	11	0 24 25.25	2.3670	7 58 54.8	14.494
34 19.09	2.3337	3 54 1.4	15.142	12	0 26 47.32	2.3687	8 13 22.7	14.435
36 39.10	2.3334	3 38 52.0	15.172	13	0 29 9.49	2.3703	8 27 47.0	14.373
38 59.10	2.3332	3 23 40.8	15.200	14	0 31 31.76	2.3720	8 42 7.5	14.311
41 19.08	2.3330	3 8 28.0	15.227	15	0 33 54.13	2.3737	8 56 24.3	14.248
43 39.06	2.3328	2 53 13.6	15.251	16	0 36 16.60	2.3755	9 10 37.2	14.181
45 59.02	2.3327	2 37 57.9	15.273	17	0 38 39.19	2.3773	9 24 46.0	14.113
48 18.98	2.3327	2 22 40.9	15.293	18	0 41 1.88	2.3790	9 38 50.7	14.043
50 38.94	2.3327	2 7 22.7	15.313	19	0 43 24.67	2.3808	9 52 51.1	13.972
52 58.90	2.3327	1 52 3.4	15.329	20	0 45 47.58	2.3828	10 6 47.3	13.899
55 18.86	2.3327	1 36 43.2	15.343	21	0 48 10.60	2.3846	10 20 39.0	13.823
57 38.82	2.3328	1 21 22.2	15.357	22	0 50 33.73	2.3864	10 34 26.1	13.747
59 58.80	2.3330	1 6 0.4	15.368	23	0 52 56.97	2.3883	10 48 8.6	13.669
2 18.78	2.3332	- 0 50 38.0	+15.378	24	0 55 20.33	2.3903	+11 1 46.4	+13.589

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 14.					MARCH 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 55 20.33	2.3903	+11 1 46.4	+13.589	0	2 52 15.30	2.4737	+19 54 12.2	+8.123
1	0 57 43.80	2.3922	11 15 19.3	13.508	1	2 54 43.75	2.4746	20 2 15.4	7.983
2	1 0 7.39	2.3941	11 28 47.3	13.425	2	2 57 12.25	2.4754	20 10 10.2	7.843
3	1 2 31.09	2.3961	11 42 10.3	13.340	3	2 59 40.80	2.4762	20 17 56.6	7.703
4	1 4 54.92	2.3981	11 55 28.1	13.253	4	3 2 9.39	2.4769	20 25 34.5	7.561
5	1 7 18.86	2.4000	12 8 40.6	13.165	5	3 4 38.03	2.4777	20 33 3.9	7.419
6	1 9 42.92	2.4020	12 21 47.9	13.076	6	3 7 6.71	2.4783	20 40 24.8	7.277
7	1 12 7.10	2.4040	12 34 49.7	12.984	7	3 9 35.48	2.4789	20 47 37.1	7.133
8	1 14 31.40	2.4060	12 47 46.0	12.892	8	3 12 4.18	2.4793	20 54 40.7	6.988
9	1 16 55.82	2.4080	13 0 36.7	12.798	9	3 14 32.95	2.4798	21 1 35.7	6.845
10	1 19 20.36	2.4100	13 13 21.7	12.703	10	3 17 1.75	2.4802	21 8 22.1	6.701
11	1 21 45.02	2.4120	13 26 1.0	12.605	11	3 19 30.57	2.4804	21 14 59.8	6.555
12	1 24 9.80	2.4141	13 38 34.3	12.506	12	3 21 59.40	2.4806	21 21 28.7	6.409
13	1 26 34.71	2.4161	13 51 1.7	12.406	13	3 24 28.24	2.4808	21 27 48.9	6.264
14	1 28 59.73	2.4180	14 3 23.0	12.303	14	3 26 57.09	2.4809	21 34 0.4	6.118
15	1 31 24.87	2.4201	14 15 38.1	12.200	15	3 29 25.95	2.4809	21 40 3.0	5.971
16	1 33 50.14	2.4221	14 27 47.0	12.096	16	3 31 54.80	2.4808	21 45 56.9	5.824
17	1 36 15.52	2.4240	14 39 49.6	11.990	17	3 34 23.64	2.4806	21 51 41.9	5.677
18	1 38 41.02	2.4260	14 51 45.8	11.883	18	3 36 52.47	2.4804	21 57 18.1	5.529
19	1 41 6.64	2.4280	15 3 35.5	11.774	19	3 39 21.29	2.4802	22 2 45.4	5.382
20	1 43 32.38	2.4300	15 15 18.7	11.664	20	3 41 50.09	2.4798	22 8 3.9	5.234
21	1 45 58.24	2.4319	15 26 55.2	11.553	21	3 44 18.86	2.4793	22 13 13.5	5.085
22	1 48 24.21	2.4338	15 38 25.0	11.440	22	3 46 47.60	2.4788	22 18 14.1	4.937
23	1 50 50.30	2.4358	+15 49 48.0	+11.326	23	3 49 16.31	2.4782	+22 23 5.9	+4.789
MARCH 15.					MARCH 17.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 53 16.50	2.4377	+16 1 4.1	+11.211	0	3 51 44.98	2.4775	+22 27 48.8	+4.641
1	1 55 42.82	2.4396	16 12 13.3	11.094	1	3 54 13.61	2.4768	22 32 22.8	4.492
2	1 58 9.25	2.4414	16 23 15.4	10.976	2	3 56 42.19	2.4758	22 36 47.8	4.343
3	2 0 35.79	2.4433	16 34 10.4	10.858	3	3 59 10.71	2.4749	22 41 3.9	4.194
4	2 3 2.44	2.4450	16 44 58.3	10.738	4	4 1 39.18	2.4740	22 45 11.1	4.046
5	2 5 29.19	2.4468	16 55 38.9	10.617	5	4 4 7.59	2.4728	22 49 9.4	3.897
6	2 7 56.06	2.4486	17 6 12.3	10.494	6	4 6 35.92	2.4717	22 52 58.7	3.748
7	2 10 23.02	2.4503	17 16 38.2	10.370	7	4 9 4.19	2.4705	22 56 39.2	3.600
8	2 12 50.09	2.4520	17 26 56.7	10.246	8	4 11 32.38	2.4691	23 0 10.7	3.450
9	2 15 17.26	2.4537	17 37 7.7	10.121	9	4 14 0.48	2.4677	23 3 33.2	3.302
10	2 17 44.53	2.4553	17 47 11.2	9.994	10	4 16 28.50	2.4662	23 6 46.9	3.153
11	2 20 11.89	2.4568	17 57 7.0	9.866	11	4 18 56.42	2.4646	23 9 51.6	3.005
12	2 22 39.35	2.4584	18 6 55.1	9.738	12	4 21 24.25	2.4630	23 12 47.5	2.858
13	2 25 6.90	2.4600	18 16 35.5	9.608	13	4 23 51.98	2.4612	23 15 34.5	2.709
14	2 27 34.55	2.4615	18 26 8.0	9.477	14	4 26 19.59	2.4593	23 18 12.6	2.562
15	2 30 2.28	2.4628	18 35 32.7	9.346	15	4 28 47.10	2.4575	23 20 41.9	2.414
16	2 32 30.09	2.4643	18 44 49.5	9.213	16	4 31 14.49	2.4554	23 23 2.3	2.267
17	2 34 57.99	2.4656	18 53 58.3	9.079	17	4 33 41.75	2.4533	23 25 13.9	2.120
18	2 37 25.96	2.4668	19 2 59.0	8.945	18	4 36 8.89	2.4513	23 27 16.7	1.973
19	2 39 54.01	2.4682	19 11 51.7	8.810	19	4 38 35.90	2.4490	23 29 10.7	1.828
20	2 42 22.14	2.4693	19 20 36.2	8.674	20	4 41 2.77	2.4468	23 30 56.0	1.682
21	2 44 50.33	2.4704	19 29 12.6	8.538	21	4 43 29.51	2.4443	23 32 32.5	1.536
22	2 47 18.59	2.4715	19 37 40.8	8.401	22	4 45 56.09	2.4418	23 34 0.3	1.390
23	2 49 46.91	2.4726	19 46 0.7	8.262	23	4 48 22.53	2.4393	23 35 19.3	1.245
24	2 52 15.30	2.4737	+19 54 12.2	+8.123	24	4 50 48.81	2.4367	+23 36 29.7	+1.101

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 18.					MARCH 20.				
	h m s	s	" "	" "		h m s	s	" "	" "
0	4 50 48.81	2.4367	+23 36 29.7	+1.101	0	6 43 31.06	2.2403	+21 54 35.3	-5.054
1	4 53 14.93	2.4340	23 37 31.4	0.957	1	6 45 45.33	2.2353	21 49 28.8	5.163
2	4 55 40.89	2.4312	23 38 24.5	0.814	2	6 47 59.29	2.2302	21 44 15.8	5.269
3	4 58 6.67	2.4283	23 39 9.1	0.671	3	6 50 12.95	2.2252	21 38 56.5	5.375
4	5 0 32.29	2.4254	23 39 45.0	0.528	4	6 52 26.31	2.2202	21 33 30.8	5.480
5	5 2 57.72	2.4224	23 40 12.4	0.386	5	6 54 39.37	2.2151	21 27 58.9	5.584
6	5 5 22.98	2.4194	23 40 31.3	0.244	6	6 56 52.12	2.2100	21 22 20.7	5.688
7	5 7 48.05	2.4162	23 40 41.7	+0.103	7	6 59 4.57	2.2049	21 16 36.4	5.790
8	5 10 12.92	2.4130	23 40 43.7	-0.037	8	7 1 16.71	2.1998	21 10 45.9	5.891
9	5 12 37.61	2.4098	23 40 37.3	0.177	9	7 3 28.55	2.1948	21 4 49.5	5.991
10	5 15 2.09	2.4063	23 40 22.5	0.316	10	7 5 40.08	2.1897	20 58 47.0	6.091
11	5 17 26.37	2.4030	23 39 59.4	0.455	11	7 7 51.31	2.1846	20 52 38.6	6.189
12	5 19 50.45	2.3995	23 39 27.9	0.593	12	7 10 2.23	2.1795	20 46 24.3	6.287
13	5 22 14.31	2.3959	23 38 48.2	0.731	13	7 12 12.85	2.1744	20 40 4.2	6.383
14	5 24 37.96	2.3923	23 38 0.2	0.868	14	7 14 23.16	2.1693	20 33 38.4	6.478
15	5 27 1.38	2.3886	23 37 4.1	1.003	15	7 16 33.16	2.1642	20 27 6.8	6.573
16	5 29 24.59	2.3848	23 35 59.8	1.139	16	7 18 42.86	2.1592	20 20 29.6	6.667
17	5 31 47.56	2.3810	23 34 47.4	1.273	17	7 20 52.26	2.1541	20 13 46.8	6.760
18	5 34 10.31	2.3772	23 33 27.0	1.408	18	7 23 1.35	2.1490	20 6 58.4	6.852
19	5 36 32.82	2.3733	23 31 58.5	1.542	19	7 25 10.14	2.1440	20 0 4.6	6.942
20	5 38 55.10	2.3693	23 30 22.0	1.674	20	7 27 18.63	2.1389	19 53 5.4	7.033
21	5 41 17.14	2.3653	23 28 37.6	1.806	21	7 29 26.81	2.1338	19 46 0.7	7.122
22	5 43 38.93	2.3612	23 26 45.3	1.937	22	7 31 34.69	2.1288	19 38 50.8	7.209
23	5 46 0.48	2.3570	+23 24 45.2	-2.068	23	7 33 42.27	2.1238	+19 31 35.6	-7.297
MARCH 19.					MARCH 21.				
	h m s	s	" "	" "		h m s	s	" "	" "
0	5 48 21.77	2.3528	+23 22 37.2	-2.198	0	7 35 49.55	2.1188	+19 24 15.2	-7.383
1	5 50 42.81	2.3486	23 20 21.5	2.326	1	7 37 56.53	2.1139	19 16 49.7	7.468
2	5 53 3.60	2.3443	23 17 58.1	2.453	2	7 40 3.22	2.1090	19 9 19.1	7.553
3	5 55 24.12	2.3399	23 15 27.1	2.581	3	7 42 9.61	2.1040	19 1 43.4	7.636
4	5 57 44.39	2.3355	23 12 48.4	2.708	4	7 44 15.70	2.0991	18 54 2.8	7.718
5	6 0 4.38	2.3311	23 10 2.2	2.833	5	7 46 21.50	2.0942	18 46 17.2	7.800
6	6 2 24.12	2.3267	23 7 8.4	2.958	6	7 48 27.00	2.0893	18 38 26.8	7.880
7	6 4 43.58	2.3220	23 4 7.2	3.082	7	7 50 32.22	2.0845	18 30 31.6	7.960
8	6 7 2.76	2.3175	23 0 58.6	3.205	8	7 52 37.14	2.0796	18 22 31.6	8.038
9	6 9 21.68	2.3130	22 57 42.6	3.328	9	7 54 41.77	2.0748	18 14 27.0	8.117
10	6 11 40.32	2.3083	22 54 19.3	3.448	10	7 56 46.11	2.0700	18 6 17.6	8.194
11	6 13 58.67	2.3036	22 50 48.8	3.569	11	7 58 50.17	2.0653	17 58 3.7	8.269
12	6 16 16.75	2.2989	22 47 11.0	3.689	12	8 0 53.94	2.0605	17 49 45.3	8.344
13	6 18 34.54	2.2942	22 43 26.1	3.808	13	8 2 57.43	2.0558	17 41 22.4	8.418
14	6 20 52.05	2.2894	22 39 34.1	3.926	14	8 5 0.64	2.0512	17 32 55.1	8.493
15	6 23 9.27	2.2846	22 35 35.0	4.043	15	8 7 3.57	2.0465	17 24 23.3	8.565
16	6 25 26.20	2.2798	22 31 29.0	4.158	16	8 9 6.22	2.0418	17 15 47.3	8.636
17	6 27 42.84	2.2749	22 27 16.0	4.274	17	8 11 8.59	2.0373	17 7 7.0	8.707
18	6 29 59.19	2.2700	22 22 56.1	4.388	18	8 13 10.69	2.0328	16 58 22.5	8.777
19	6 32 15.24	2.2651	22 18 29.4	4.502	19	8 15 12.52	2.0283	16 49 33.8	8.846
20	6 34 31.00	2.2602	22 13 55.9	4.614	20	8 17 14.08	2.0238	16 40 41.0	8.913
21	6 36 46.46	2.2553	22 9 15.7	4.726	21	8 19 15.37	2.0193	16 31 44.2	8.981
22	6 39 1.63	2.2503	22 4 28.8	4.837	22	8 21 16.39	2.0148	16 22 43.3	9.048
23	6 41 16.49	2.2453	21 59 35.3	4.946	23	8 23 17.15	2.0104	16 13 38.5	9.113
24	6 43 31.06	2.2403	+21 54 35.3	-5.054	24	8 25 17.64	2.0061	+16 4 29.8	-9.177

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
MARCH 22.									MARCH 24.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	8	25	17.64	2.0061	+16	4	29.8	-9.177	0	9	57	22.68	1.8487	+7	45	12.1	-11.328
1	8	27	17.88	2.0018	15	55	17.3	9.241	1	9	59	13.54	1.8466	7	33	51.6	11.354
2	8	29	17.86	1.9975	15	46	0.9	9.303	2	10	1	4.27	1.8446	7	22	29.6	11.380
3	8	31	17.58	1.9933	15	36	40.9	9.365	3	10	2	54.89	1.8426	7	11	6.0	11.405
4	8	33	17.05	1.9891	15	27	17.1	9.427	4	10	4	45.38	1.8406	6	59	41.0	11.429
5	8	35	16.27	1.9849	15	17	49.7	9.487	5	10	6	35.76	1.8388	6	48	14.5	11.453
6	8	37	15.24	1.9808	15	8	18.7	9.547	6	10	8	26.03	1.8370	6	36	46.6	11.476
7	8	39	13.97	1.9768	14	58	44.1	9.606	7	10	10	16.20	1.8352	6	25	17.4	11.498
8	8	41	12.45	1.9727	14	49	6.0	9.663	8	10	12	6.25	1.8334	6	13	46.9	11.519
9	8	43	10.69	1.9687	14	39	24.5	9.720	9	10	13	56.21	1.8318	6	2	15.1	11.540
10	8	45	8.69	1.9648	14	29	39.6	9.776	10	10	15	46.07	1.8302	5	50	42.1	11.560
11	8	47	6.46	1.9608	14	19	51.4	9.831	11	10	17	35.83	1.8286	5	39	7.9	11.580
12	8	49	3.99	1.9569	14	9	59.9	9.885	12	10	19	25.50	1.8271	5	27	32.5	11.598
13	8	51	1.29	1.9531	14	0	5.2	9.939	13	10	21	15.08	1.8257	5	15	56.1	11.616
14	8	52	58.36	1.9493	13	50	7.2	9.993	14	10	23	4.58	1.8243	5	4	18.6	11.633
15	8	54	55.21	1.9456	13	40	6.1	10.043	15	10	24	54.00	1.8229	4	52	40.1	11.650
16	8	56	51.83	1.9418	13	30	2.0	10.095	16	10	26	43.33	1.8216	4	41	0.6	11.666
17	8	58	48.23	1.9382	13	19	54.7	10.146	17	10	28	32.59	1.8203	4	29	20.2	11.682
18	9	0	44.41	1.9346	13	9	44.5	10.195	18	10	30	21.77	1.8192	4	17	38.8	11.696
19	9	2	40.38	1.9311	12	59	31.3	10.244	19	10	32	10.89	1.8181	4	5	56.7	11.709
20	9	4	36.14	1.9275	12	49	15.2	10.292	20	10	33	59.94	1.8169	3	54	13.7	11.723
21	9	6	31.68	1.9240	12	38	56.3	10.339	21	10	35	48.92	1.8158	3	42	29.9	11.735
22	9	8	27.02	1.9207	12	28	34.5	10.386	22	10	37	37.84	1.8149	3	30	45.5	11.747
23	9	10	22.16	1.9173	+12	18	10.0	-10.432	23	10	39	26.71	1.8140	+3	19	0.3	-11.758
MARCH 23.									MARCH 25.								
0	9	12	17.09	1.9139	+12	7	42.7	-10.477	0	10	41	15.52	1.8131	+3	7	14.5	-11.768
1	9	14	11.83	1.9107	11	57	12.8	10.521	1	10	43	4.28	1.8123	2	55	28.1	11.778
2	9	16	6.37	1.9073	11	46	40.2	10.564	2	10	44	52.99	1.8115	2	43	41.1	11.788
3	9	18	0.71	1.9042	11	36	5.1	10.606	3	10	46	41.66	1.8108	2	31	53.6	11.796
4	9	19	54.87	1.9011	11	25	27.5	10.648	4	10	48	30.29	1.8102	2	20	5.6	11.804
5	9	21	48.84	1.8980	11	14	47.3	10.690	5	10	50	18.88	1.8095	2	8	17.1	11.811
6	9	23	42.63	1.8949	11	4	4.7	10.730	6	10	52	7.43	1.8089	1	56	28.3	11.817
7	9	25	36.23	1.8919	10	53	19.7	10.769	7	10	53	55.95	1.8084	1	44	39.1	11.823
8	9	27	29.66	1.8890	10	42	32.4	10.808	8	10	55	44.44	1.8079	1	32	49.6	11.828
9	9	29	22.91	1.8861	10	31	42.8	10.846	9	10	57	32.90	1.8075	1	20	59.8	11.833
10	9	31	15.99	1.8833	10	20	50.9	10.883	10	10	59	21.34	1.8073	1	9	9.7	11.836
11	9	33	8.90	1.8804	10	9	56.8	10.920	11	11	1	9.77	1.8069	0	57	19.5	11.838
12	9	35	1.64	1.8777	9	59	0.5	10.956	12	11	2	58.17	1.8066	0	45	29.1	11.841
13	9	36	54.22	1.8750	9	48	2.1	10.991	13	11	4	46.56	1.8064	0	33	38.6	11.843
14	9	38	46.64	1.8723	9	37	1.6	11.025	14	11	6	34.94	1.8063	0	21	48.0	11.843
15	9	40	38.90	1.8698	9	25	59.1	11.058	15	11	8	23.32	1.8063	+0	9	57.4	11.844
16	9	42	31.01	1.8673	9	14	54.6	11.091	16	11	10	11.69	1.8062	-0	1	53.3	11.844
17	9	44	22.97	1.8647	9	3	48.2	11.123	17	11	12	0.06	1.8062	0	13	43.9	11.843
18	9	46	14.77	1.8623	8	52	39.8	11.155	18	11	13	48.43	1.8063	0	25	34.4	11.840
19	9	48	6.44	1.8599	8	41	29.6	11.185	19	11	15	36.81	1.8063	0	37	24.7	11.838
20	9	49	57.96	1.8575	8	30	17.6	11.215	20	11	17	25.19	1.8064	0	49	14.9	11.835
21	9	51	49.34	1.8553	8	19	3.8	11.245	21	11	19	13.58	1.8067	1	1	4.9	11.831
22	9	53	40.59	1.8530	8	7	48.2	11.273	22	11	21	1.99	1.8070	1	12	54.6	11.826
23	9	55	31.70	1.8508	7	56	31.0	11.301	23	11	22	50.42	1.8073	1	24	44.0	11.821
24	9	57	22.68	1.8487	+7	45	12.1	-11.328	24	11	24	38.86	1.8076	-1	36	33.1	-11.815

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 26.					MARCH 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 24 38.86	1.8076	-1 36 33.1	-11.515	0	12 52 46.63	1.8825	-10 43 43.7	-10.710
1	11 26 27.33	1.8081	1 48 21.8	11.809	1	12 54 39.66	1.8852	10 54 25.1	10.609
2	11 28 15.83	1.8085	2 0 10.2	11.802	2	12 56 32.85	1.8879	11 5 4.0	10.627
3	11 30 4.35	1.8090	2 11 58.0	11.793	3	12 58 26.21	1.8908	11 15 40.3	10.584
4	11 31 52.91	1.8097	2 23 45.4	11.785	4	13 0 19.74	1.8935	11 26 14.1	10.542
5	11 33 41.51	1.8103	2 35 32.2	11.776	5	13 2 13.43	1.8963	11 36 45.3	10.498
6	11 35 30.14	1.8109	2 47 18.5	11.766	6	13 4 7.29	1.8992	11 47 13.9	10.453
7	11 37 18.82	1.8117	2 59 4.1	11.755	7	13 6 1.33	1.9021	11 57 39.7	10.408
8	11 39 7.54	1.8124	3 10 49.1	11.744	8	13 7 55.54	1.9050	12 8 2.8	10.361
9	11 40 56.31	1.8133	3 22 33.4	11.732	9	13 9 49.93	1.9079	12 18 23.0	10.314
10	11 42 45.13	1.8141	3 34 16.9	11.719	10	13 11 44.49	1.9110	12 28 40.5	10.267
11	11 44 34.00	1.8150	3 45 59.7	11.706	11	13 13 39.25	1.9141	12 38 55.0	10.218
12	11 46 22.93	1.8160	3 57 41.6	11.692	12	13 15 34.18	1.9171	12 49 6.6	10.168
13	11 48 11.92	1.8171	4 9 22.7	11.677	13	13 17 29.30	1.9203	12 59 15.2	10.119
14	11 50 0.98	1.8181	4 21 2.8	11.661	14	13 19 24.61	1.9234	13 9 20.9	10.068
15	11 51 50.09	1.8192	4 32 42.0	11.645	15	13 21 20.11	1.9267	13 19 23.4	10.016
16	11 53 39.28	1.8204	4 44 20.2	11.628	16	13 23 15.81	1.9299	13 29 22.8	9.964
17	11 55 28.54	1.8217	4 55 57.4	11.611	17	13 25 11.70	1.9332	13 39 19.1	9.911
18	11 57 17.88	1.8229	5 7 33.5	11.593	18	13 27 7.79	1.9364	13 49 12.1	9.856
19	11 59 7.29	1.8242	5 19 8.5	11.573	19	13 29 4.07	1.9398	13 59 1.8	9.802
20	12 0 56.78	1.8256	5 30 42.3	11.553	20	13 31 0.56	1.9432	14 8 48.3	9.747
21	12 2 46.36	1.8270	5 42 14.9	11.533	21	13 32 57.25	1.9465	14 18 31.4	9.690
22	12 4 36.02	1.8284	5 53 46.3	11.513	22	13 34 54.14	1.9499	14 28 11.1	9.633
23	12 6 25.77	1.8299	-6 5 16.4	-11.491	23	13 36 51.24	1.9534	-14 37 47.3	-9.574
MARCH 27.					MARCH 29.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 8 15.61	1.8315	-6 16 45.2	-11.468	0	13 38 48.55	1.9569	-14 47 20.0	-9.516
1	12 10 5.55	1.8331	6 28 12.6	11.445	1	13 40 46.07	1.9604	14 56 49.2	9.457
2	12 11 55.58	1.8348	6 39 38.6	11.421	2	13 42 43.80	1.9639	15 6 14.8	9.396
3	12 13 45.72	1.8365	6 51 3.1	11.396	3	13 44 41.74	1.9675	15 15 36.7	9.335
4	12 15 35.96	1.8382	7 2 26.1	11.370	4	13 46 39.90	1.9712	15 24 55.0	9.273
5	12 17 26.30	1.8399	7 13 47.5	11.344	5	13 48 38.28	1.9748	15 34 9.4	9.209
6	12 19 16.75	1.8418	7 25 7.4	11.318	6	13 50 36.87	1.9784	15 43 20.1	9.147
7	12 21 7.32	1.8438	7 36 25.6	11.290	7	13 52 35.69	1.9821	15 52 27.0	9.083
8	12 22 58.00	1.8457	7 47 42.2	11.262	8	13 54 34.72	1.9858	16 1 30.0	9.017
9*	12 24 48.80	1.8476	7 58 57.0	11.233	9	13 56 33.98	1.9896	16 10 29.0	8.951
10	12 26 39.71	1.8496	8 10 10.1	11.203	10	13 58 33.47	1.9933	16 19 24.1	8.884
11	12 28 30.75	1.8518	8 21 21.4	11.173	11	14 0 33.18	1.9970	16 28 15.1	8.816
12	12 30 21.92	1.8538	8 32 30.8	11.141	12	14 2 33.11	2.0008	16 37 2.0	8.748
13	12 32 13.21	1.8560	8 43 38.3	11.110	13	14 4 33.27	2.0047	16 45 44.8	8.678
14	12 34 4.64	1.8582	8 54 44.0	11.078	14	14 6 33.67	2.0085	16 54 23.4	8.608
15	12 35 56.19	1.8604	9 5 47.6	11.043	15	14 8 34.29	2.0123	17 2 57.8	8.538
16	12 37 47.89	1.8628	9 16 49.2	11.009	16	14 10 35.15	2.0163	17 11 27.9	8.465
17	12 39 39.72	1.8650	9 27 48.7	10.974	17	14 12 36.24	2.0201	17 19 53.6	8.393
18	12 41 31.69	1.8674	9 38 46.1	10.939	18	14 14 37.56	2.0240	17 28 15.0	8.320
19	12 43 23.81	1.8698	9 49 41.4	10.903	19	14 16 39.12	2.0280	17 36 32.0	8.246
20	12 45 16.07	1.8723	10 0 34.4	10.866	20	14 18 40.92	2.0319	17 44 44.5	8.171
21	12 47 8.48	1.8748	10 11 25.3	10.828	21	14 20 42.95	2.0359	17 52 52.5	8.095
22	12 49 1.04	1.8773	10 22 13.8	10.788	22	14 22 45.23	2.0399	18 0 55.9	8.018
23	12 50 53.76	1.8799	10 32 59.9	10.749	23	14 24 47.74	2.0438	18 8 54.7	7.941
24	12 52 46.63	1.8825	-10 43 43.7	-10.710	24	14 26 50.49	2.0478	-18 16 48.8	-7.863

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 30.					APRIL 1.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 26 50.49	2.0478	-18 16 48.8	-7.863	0	16 9 44.48	2.2348	-22 48 56.9	-3.185
1	14 28 53.48	2.0518	18 24 38.2	7.783	1	16 11 58.67	2.2381	22 52 4.6	3.070
2	14 30 56.71	2.0558	18 32 22.8	7.703	2	16 14 13.05	2.2414	22 55 5.3	2.954
3	14 33 0.18	2.0598	18 40 2.6	7.623	3	16 16 27.64	2.2448	22 57 59.1	2.838
4	14 35 3.89	2.0639	18 47 37.5	7.541	4	16 18 42.42	2.2479	23 0 45.8	2.721
5	14 37 7.85	2.0680	18 55 7.5	7.459	5	16 20 57.39	2.2512	23 3 25.6	2.603
6	14 39 12.05	2.0720	19 2 32.6	7.377	6	16 23 12.56	2.2543	23 5 58.2	2.485
7	14 41 16.49	2.0761	19 9 52.7	7.292	7	16 25 27.91	2.2574	23 8 23.8	2.367
8	14 43 21.18	2.0801	19 17 7.6	7.207	8	16 27 43.45	2.2605	23 10 42.2	2.248
9	14 45 26.10	2.0842	19 24 17.5	7.123	9	16 29 59.17	2.2635	23 12 53.5	2.128
10	14 47 31.28	2.0883	19 31 22.3	7.036	10	16 32 15.07	2.2665	23 14 57.6	2.008
11	14 49 36.70	2.0923	19 38 21.8	6.948	11	16 34 31.15	2.2694	23 16 54.4	1.886
12	14 51 42.36	2.0964	19 45 16.0	6.860	12	16 36 47.40	2.2723	23 18 43.9	1.765
13	14 53 48.27	2.1005	19 52 5.0	6.772	13	16 39 3.82	2.2752	23 20 26.2	1.643
14	14 55 54.42	2.1045	19 58 48.6	6.682	14	16 41 20.42	2.2780	23 22 1.1	1.521
15	14 58 0.81	2.1086	20 5 26.8	6.592	15	16 43 37.18	2.2807	23 23 28.7	1.398
16	15 0 7.45	2.1127	20 11 59.6	6.501	16	16 45 54.10	2.2833	23 24 48.9	1.275
17	15 2 14.33	2.1168	20 18 26.9	6.409	17	16 48 11.18	2.2860	23 26 1.7	1.152
18	15 4 21.46	2.1208	20 24 48.7	6.316	18	16 50 28.42	2.2886	23 27 7.1	1.028
19	15 6 28.83	2.1248	20 31 4.8	6.222	19	16 52 45.81	2.2910	23 28 5.0	0.903
20	15 8 36.44	2.1289	20 37 15.3	6.128	20	16 55 3.34	2.2935	23 28 55.4	0.777
21	15 10 44.30	2.1329	20 43 20.2	6.033	21	16 57 21.03	2.2961	23 29 38.2	0.651
22	15 12 52.39	2.1369	20 49 19.3	5.937	22	16 59 38.87	2.2984	23 30 13.5	0.526
23	15 15 0.73	2.1410	-20 55 12.6	-5.840	23	17 1 56.84	2.3007	-23 30 41.3	-0.399
MARCH 31.					APRIL 2.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 17 9.31	2.1430	-21 1 0.1	-5.743	0	17 4 14.95	2.3029	-23 31 1.4	-0.273
1	15 19 18.13	2.1480	21 6 41.7	5.644	1	17 6 33.19	2.3052	23 31 14.0	0.146
2	15 21 27.18	2.1529	21 12 17.4	5.546	2	17 8 51.57	2.3073	23 31 18.9	-0.018
3	15 23 36.48	2.1569	21 17 47.2	5.446	3	17 11 10.07	2.3094	23 31 16.1	-0.110
4	15 25 46.01	2.1608	21 23 10.9	5.345	4	17 13 28.70	2.3114	23 31 5.7	0.238
5	15 27 55.78	2.1648	21 28 28.6	5.244	5	17 15 47.44	2.3134	23 30 47.6	0.367
6	15 30 5.79	2.1687	21 33 40.2	5.142	6	17 18 6.31	2.3153	23 30 21.7	0.496
7	15 32 16.02	2.1725	21 38 45.6	5.039	7	17 20 25.28	2.3172	23 29 48.1	0.625
8	15 34 26.49	2.1765	21 43 44.9	4.936	8	17 22 44.37	2.3190	23 29 6.7	0.754
9	15 36 37.20	2.1803	21 48 37.9	4.832	9	17 25 3.56	2.3207	23 28 17.6	0.883
10	15 38 48.13	2.1841	21 53 24.7	4.727	10	17 27 22.85	2.3223	23 27 20.7	1.013
11	15 40 59.29	2.1879	21 58 5.1	4.621	11	17 29 42.24	2.3240	23 26 16.0	1.144
12	15 43 10.68	2.1917	22 2 39.2	4.515	12	17 32 1.73	2.3256	23 25 3.4	1.275
13	15 45 22.29	2.1954	22 7 6.9	4.408	13	17 34 21.31	2.3271	23 23 43.0	1.405
14	15 47 34.13	2.1993	22 11 28.1	4.299	14	17 36 40.98	2.3286	23 22 14.8	1.535
15	15 49 46.20	2.2029	22 15 42.8	4.192	15	17 39 0.74	2.3299	23 20 38.8	1.667
16	15 51 58.48	2.2065	22 19 51.1	4.083	16	17 41 20.57	2.3313	23 18 54.8	1.798
17	15 54 10.98	2.2102	22 23 52.7	3.972	17	17 43 40.49	2.3326	23 17 3.0	1.929
18	15 56 23.70	2.2138	22 27 47.7	3.862	18	17 46 0.48	2.3338	23 15 3.3	2.060
19	15 58 36.03	2.2173	22 31 36.1	3.751	19	17 48 20.54	2.3349	23 12 55.8	2.192
20	16 0 49.78	2.2210	22 35 17.8	3.639	20	17 50 40.67	2.3360	23 10 40.3	2.324
21	16 3 3.15	2.2245	22 38 52.8	3.527	21	17 53 0.86	2.3370	23 8 16.9	2.455
22	16 5 16.72	2.2279	22 42 21.0	3.413	22	17 55 21.11	2.3380	23 5 45.7	2.587
23	16 7 30.50	2.2313	22 45 42.4	3.299	23	17 57 41.42	2.3389	23 3 6.5	2.720
24	16 9 44.48	2.2348	-22 48 56.9	-3.185	24	18 0 1.78	2.3398	-23 0 19.3	-2.852

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 3.					APRIL 5.				
0	h m s	s	" "	" "	0	h m s	s	" "	" "
0	18 0 1.78	2.3398	-23 0 19.3	+2.852	0	19 52 21.91	2.3254	-18 14 2.7	+8.951
1	18 2 22.19	2.3406	22 57 24.3	2.983	1	19 54 41.40	2.3243	18 5 2.1	9.068
2	18 4 42.65	2.3413	22 54 21.3	3.116	2	19 57 0.83	2.3233	17 55 54.6	9.183
3	18 7 3.15	2.3420	22 51 10.4	3.247	3	19 59 20.19	2.3221	17 46 40.2	9.297
4	18 9 23.69	2.3427	22 47 51.7	3.379	4	20 1 39.48	2.3210	17 37 19.0	9.411
5	18 11 44.27	2.3433	22 44 24.9	3.512	5	20 3 58.71	2.3199	17 27 50.9	9.524
6	18 14 4.88	2.3437	22 40 50.3	3.643	6	20 6 17.87	2.3188	17 18 16.1	9.636
7	18 16 25.51	2.3442	22 37 7.7	3.775	7	20 8 36.97	2.3177	17 8 34.6	9.748
8	18 18 46.18	2.3446	22 33 17.3	3.907	8	20 10 55.99	2.3165	16 58 46.3	9.859
9	18 21 6.86	2.3449	22 29 18.9	4.039	9	20 13 14.95	2.3154	16 48 51.5	9.968
10	18 23 27.57	2.3453	22 25 12.6	4.172	10	20 15 33.84	2.3143	16 38 50.1	10.078
11	18 25 48.29	2.3455	22 20 58.3	4.303	11	20 17 52.66	2.3132	16 28 42.1	10.186
12	18 28 9.03	2.3458	22 16 36.3	4.433	12	20 20 11.42	2.3120	16 18 27.8	10.293
13	18 30 29.78	2.3458	22 12 6.3	4.565	13	20 22 30.10	2.3108	16 8 7.0	10.401
14	18 32 50.53	2.3459	22 7 28.5	4.696	14	20 24 48.72	2.3098	15 57 39.7	10.507
15	18 35 11.29	2.3460	22 2 42.8	4.828	15	20 27 7.27	2.3086	15 47 6.2	10.611
16	18 37 32.05	2.3459	21 57 49.2	4.958	16	20 29 25.75	2.3075	15 36 26.4	10.715
17	18 39 52.80	2.3458	21 52 47.8	5.088	17	20 31 44.17	2.3064	15 25 40.4	10.818
18	18 42 13.55	2.3458	21 47 38.6	5.218	18	20 34 2.52	2.3053	15 14 48.2	10.921
19	18 44 34.30	2.3457	21 42 21.6	5.349	19	20 36 20.80	2.3041	15 3 49.9	11.023
20	18 46 55.03	2.3454	21 36 56.7	5.479	20	20 38 39.01	2.3030	14 52 45.5	11.123
21	18 49 15.75	2.3453	21 31 24.1	5.608	21	20 40 57.16	2.3020	14 41 35.2	11.222
22	18 51 36.46	2.3449	21 25 43.7	5.738	22	20 43 15.25	2.3009	14 30 18.9	11.320
23	18 53 57.14	2.3446	-21 19 55.6	+5.867	23	20 45 33.27	2.2998	-14 18 56.8	+11.417
APRIL 4.					APRIL 6.				
0	h m s	s	" "	" "	0	h m s	s	" "	" "
0	18 56 17.81	2.3443	-21 13 59.7	+5.996	0	20 47 51.23	2.2988	-14 7 28.9	+11.513
1	18 58 38.45	2.3438	21 7 56.1	6.124	1	20 50 9.13	2.2978	13 55 55.2	11.609
2	19 0 59.07	2.3434	21 1 44.8	6.252	2	20 52 26.96	2.2968	13 44 15.8	11.703
3	19 3 19.66	2.3429	20 55 25.9	6.379	3	20 54 44.74	2.2958	13 32 30.8	11.797
4	19 5 40.22	2.3423	20 48 59.3	6.508	4	20 57 2.45	2.2948	13 20 40.2	11.888
5	19 8 0.74	2.3418	20 42 25.0	6.634	5	20 59 20.11	2.2938	13 8 44.2	11.979
6	19 10 21.23	2.3412	20 35 43.2	6.760	6	21 1 37.71	2.2929	12 56 42.7	12.070
7	19 12 41.68	2.3405	20 28 53.8	6.887	7	21 3 55.26	2.2920	12 44 35.8	12.159
8	19 15 2.09	2.3399	20 21 56.8	7.013	8	21 6 12.75	2.2911	12 32 23.6	12.248
9	19 17 22.47	2.3393	20 14 52.3	7.138	9	21 8 30.19	2.2903	12 20 6.1	12.334
10	19 19 42.80	2.3384	20 7 40.3	7.262	10	21 10 47.58	2.2894	12 7 43.5	12.419
11	19 22 3.08	2.3376	20 0 20.9	7.386	11	21 13 4.92	2.2886	11 55 15.8	12.503
12	19 24 23.31	2.3368	19 52 54.0	7.510	12	21 15 22.21	2.2878	11 42 43.1	12.587
13	19 26 43.50	2.3360	19 45 19.7	7.633	13	21 17 39.45	2.2870	11 30 5.4	12.669
14	19 29 3.63	2.3352	19 37 38.0	7.757	14	21 19 56.65	2.2863	11 17 22.8	12.750
15	19 31 23.72	2.3343	19 29 48.9	7.878	15	21 22 13.81	2.2857	11 4 35.4	12.830
16	19 33 43.75	2.3334	19 21 52.6	8.000	16	21 24 30.93	2.2849	10 51 43.2	12.908
17	19 36 3.73	2.3325	19 13 48.9	8.121	17	21 26 48.00	2.2843	10 38 46.4	12.986
18	19 38 23.65	2.3315	19 5 38.1	8.241	18	21 29 5.04	2.2838	10 25 44.9	13.062
19	19 40 43.51	2.3305	18 57 20.0	8.362	19	21 31 22.05	2.2832	10 12 39.0	13.136
20	19 43 3.31	2.3295	18 48 54.7	8.481	20	21 33 39.02	2.2826	9 59 28.6	13.211
21	19 45 23.05	2.3285	18 40 22.3	8.599	21	21 35 55.96	2.2822	9 46 13.7	13.283
22	19 47 42.73	2.3275	18 31 42.8	8.718	22	21 38 12.88	2.2817	9 32 54.6	13.353
23	19 50 2.35	2.3265	18 22 56.2	8.834	23	21 40 29.76	2.2812	9 19 31.3	13.423
24	19 52 21.91	2.3254	-18 14 2.7	+8.951	24	21 42 46.62	2.2808	-9 6 3.9	+13.491

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 7.					APRIL 9.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 42 46.62	2.2808	-9 6 3.9	+13.491	0	23 32 39.38	2.3162	+ 2 32 17.1	+14.988
1	21 45 3.46	2.2805	8 52 32.4	13.558	1	23 34 58.41	2.3182	2 47 16.1	14.978
2	21 47 20.28	2.2802	8 38 56.9	13.624	2	23 37 17.56	2.3202	3 2 14.5	14.967
3	21 49 37.08	2.2798	8 25 17.5	13.688	3	23 39 36.83	2.3222	3 17 12.1	14.953
4	21 51 53.86	2.2797	8 11 34.3	13.751	4	23 41 56.22	2.3243	3 32 8.8	14.937
5	21 54 10.64	2.2795	7 57 47.4	13.813	5	23 44 15.74	2.3264	3 47 4.5	14.919
6	21 56 27.40	2.2793	7 43 56.8	13.873	6	23 46 35.39	2.3286	4 1 59.1	14.900
7	21 58 44.15	2.2792	7 30 2.7	13.932	7	23 48 55.17	2.3308	4 16 52.5	14.878
8	22 1 0.90	2.2792	7 16 5.0	13.989	8	23 51 15.09	2.3331	4 31 44.5	14.855
9	22 3 17.65	2.2792	7 2 4.0	14.045	9	23 53 35.14	2.3354	4 46 35.1	14.831
10	22 5 34.40	2.2792	6 47 59.6	14.099	10	23 55 55.34	2.3378	5 1 24.2	14.804
11	22 7 51.15	2.2793	6 33 52.1	14.152	11	23 58 15.68	2.3402	5 16 11.6	14.775
12	22 10 7.91	2.2793	6 19 41.4	14.203	12	0 0 36.16	2.3426	5 30 57.2	14.744
13	22 12 24.67	2.2795	6 5 27.7	14.253	13	0 2 56.79	2.3451	5 45 40.9	14.712
14	22 14 41.45	2.2798	5 51 11.0	14.303	14	0 5 17.57	2.3476	6 0 22.6	14.678
15	22 16 58.24	2.2799	5 36 51.4	14.350	15	0 7 38.50	2.3501	6 15 2.2	14.642
16	22 19 15.04	2.2803	5 22 29.0	14.395	16	0 9 59.58	2.3528	6 29 39.6	14.603
17	22 21 31.87	2.2806	5 8 4.0	14.438	17	0 12 20.83	2.3554	6 44 14.6	14.563
18	22 23 48.71	2.2810	4 53 36.4	14.482	18	0 14 42.23	2.3581	6 58 47.2	14.522
19	22 26 5.59	2.2815	4 39 6.2	14.523	19	0 17 3.80	2.3608	7 13 17.2	14.478
20	22 28 22.49	2.2819	4 24 33.7	14.562	20	0 19 25.53	2.3635	7 27 44.5	14.432
21	22 30 39.42	2.2825	4 9 58.8	14.600	21	0 21 47.42	2.3663	7 42 9.0	14.384
22	22 32 56.39	2.2831	3 55 21.7	14.636	22	0 24 9.48	2.3691	7 56 30.6	14.335
23	22 35 13.39	2.2838	-3 40 42.5	+14.670	23	0 26 31.71	2.3719	+ 8 10 49.2	+14.284
APRIL 8.					APRIL 10.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 37 30.44	2.2845	-3 26 1.3	+14.703	0	0 28 54.11	2.3748	+ 8 25 4.7	+14.231
1	22 39 47.53	2.2852	3 11 18.1	14.735	1	0 31 16.68	2.3777	8 39 16.9	14.176
2	22 42 4.66	2.2859	2 56 33.1	14.764	2	0 33 39.43	2.3807	8 53 25.8	14.119
3	22 44 21.84	2.2868	2 41 46.4	14.793	3	0 36 2.36	2.3836	9 7 31.2	14.060
4	22 46 39.07	2.2877	2 26 58.0	14.819	4	0 38 25.46	2.3865	9 21 33.0	13.999
5	22 48 56.36	2.2887	2 12 8.1	14.844	5	0 40 48.74	2.3895	9 35 31.1	13.937
6	22 51 13.71	2.2897	1 57 16.7	14.868	6	0 43 12.20	2.3925	9 49 25.4	13.873
7	22 53 31.12	2.2907	1 42 24.0	14.888	7	0 45 35.84	2.3956	10 3 15.8	13.807
8	22 55 48.59	2.2918	1 27 30.1	14.908	8	0 47 59.67	2.3986	10 17 2.2	13.738
9	22 58 6.13	2.2929	1 12 35.0	14.927	9	0 50 23.67	2.4017	10 30 44.4	13.668
10	23 0 23.74	2.2942	0 57 38.8	14.943	10	0 52 47.87	2.4048	10 44 22.4	13.597
11	23 2 41.43	2.2953	0 42 41.8	14.958	11	0 55 12.25	2.4078	10 57 56.0	13.523
12	23 4 59.18	2.2966	0 27 43.9	14.971	12	0 57 36.81	2.4109	11 11 25.1	13.448
13	23 7 17.02	2.2980	-0 12 45.3	14.982	13	1 0 1.56	2.4141	11 24 49.7	13.371
14	23 9 34.94	2.2994	+0 2 13.9	14.992	14	1 2 26.50	2.4173	11 38 9.6	13.292
15	23 11 52.95	2.3009	0 17 13.7	15.000	15	1 4 51.63	2.4204	11 51 24.7	13.211
16	23 14 11.05	2.3024	0 32 13.9	15.005	16	1 7 16.95	2.4236	12 4 34.9	13.128
17	23 16 29.24	2.3039	0 47 14.3	15.009	17	1 9 42.46	2.4268	12 17 40.1	13.044
18	23 18 47.52	2.3055	1 2 15.0	15.012	18	1 12 8.16	2.4299	12 30 40.2	12.958
19	23 21 5.90	2.3073	1 17 15.7	15.013	19	1 14 34.05	2.4331	12 43 35.0	12.870
20	23 23 24.39	2.3089	1 32 16.5	15.012	20	1 17 0.13	2.4363	12 56 24.6	12.781
21	23 25 42.97	2.3106	1 47 17.1	15.008	21	1 19 26.40	2.4394	13 9 8.7	12.689
22	23 28 1.66	2.3125	2 2 17.5	15.003	22	1 21 52.86	2.4426	13 21 47.3	12.596
23	23 30 20.47	2.3143	2 17 17.5	14.997	23	1 24 19.51	2.4458	13 34 20.2	12.501
24	23 32 39.38	2.3162	+2 32 17.1	+14.988	24	1 26 46.35	2.4489	+13 46 47.4	+12.405

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
APRIL 11.									APRIL 13.								
	h	m	s	s	"	'	"	"		h	m	s	s	"	'	"	"
0	1	26	46.35	2.4489	+13	46	47.4	+12.405	0	3	27	20.50	2.5531	+21	23	28.7	+6.173
1	1	29	13.38	2.4520	13	59	8.8	12.308	1	3	29	53.70	2.5536	21	29	34.5	6.020
2	1	31	40.59	2.4552	14	11	24.3	12.208	2	3	32	26.93	2.5539	21	35	31.1	5.867
3	1	34	8.00	2.4583	14	23	33.7	12.106	3	3	35	0.17	2.5541	21	41	18.5	5.713
4	1	36	35.59	2.4614	14	35	37.0	12.003	4	3	37	33.42	2.5543	21	46	56.6	5.553
5	1	39	3.37	2.4645	14	47	34.1	11.898	5	3	40	6.68	2.5543	21	52	25.5	5.403
6	1	41	31.33	2.4675	14	59	24.8	11.792	6	3	42	39.94	2.5542	21	57	45.0	5.248
7	1	43	59.47	2.4706	15	11	9.1	11.684	7	3	45	13.18	2.5540	22	2	55.3	5.093
8	1	46	27.80	2.4736	15	22	46.9	11.575	8	3	47	46.42	2.5538	22	7	56.2	4.938
9	1	48	56.30	2.4766	15	34	18.1	11.464	9	3	50	19.63	2.5533	22	12	47.8	4.782
10	1	51	24.99	2.4796	15	45	42.6	11.352	10	3	52	52.82	2.5528	22	17	30.0	4.626
11	1	53	53.85	2.4825	15	57	0.3	11.238	11	3	55	25.97	2.5523	22	22	2.9	4.470
12	1	56	22.89	2.4854	16	8	11.1	11.122	12	3	57	59.09	2.5516	22	26	26.4	4.313
13	1	58	52.10	2.4883	16	19	14.9	11.005	13	4	0	32.16	2.5508	22	30	40.5	4.157
14	2	1	21.49	2.4913	16	30	11.7	10.887	14	4	3	5.18	2.5498	22	34	45.2	4.000
15	2	3	51.05	2.4940	16	41	1.3	10.767	15	4	5	38.14	2.5488	22	38	40.5	3.844
16	2	6	20.77	2.4968	16	51	43.7	10.646	16	4	8	11.04	2.5477	22	42	26.5	3.688
17	2	8	50.66	2.4995	17	2	18.8	10.523	17	4	10	43.86	2.5464	22	46	3.0	3.530
18	2	11	20.71	2.5022	17	12	46.5	10.398	18	4	13	16.61	2.5451	22	49	30.1	3.374
19	2	13	50.92	2.5048	17	23	6.6	10.273	19	4	15	49.27	2.5437	22	52	47.9	3.218
20	2	16	21.29	2.5074	17	33	19.3	10.147	20	4	18	21.85	2.5421	22	55	56.2	3.061
21	2	18	51.81	2.5099	17	43	24.3	10.019	21	4	20	54.32	2.5404	22	58	55.2	2.905
22	2	21	22.48	2.5124	17	53	21.6	9.890	22	4	23	26.70	2.5387	23	1	44.8	2.748
23	2	23	53.30	2.5149	+18	3	11.1	+ 9.759	23	4	25	58.96	2.5368	+23	4	25.0	+2.593
APRIL 12.									APRIL 14.								
	h	m	s	s	"	'	"	"		h	m	s	s	"	'	"	"
0	2	26	24.27	2.5173	+18	12	52.7	+ 9.628	0	4	28	31.11	2.5348	+23	6	55.9	+2.438
1	2	28	55.38	2.5197	18	22	26.4	9.495	1	4	31	3.14	2.5328	23	9	17.5	2.282
2	2	31	26.63	2.5219	18	31	52.1	9.361	2	4	33	35.04	2.5305	23	11	29.7	2.126
3	2	33	58.01	2.5241	18	41	9.7	9.226	3	4	36	6.80	2.5282	23	13	32.6	1.972
4	2	36	29.52	2.5263	18	50	19.2	9.089	4	4	38	38.42	2.5258	23	15	26.3	1.818
5	2	39	1.16	2.5283	18	59	20.4	8.952	5	4	41	9.89	2.5233	23	17	10.7	1.663
6	2	41	32.92	2.5303	19	8	13.4	8.813	6	4	43	41.22	2.5208	23	18	45.9	1.510
7	2	44	4.80	2.5323	19	16	58.0	8.674	7	4	46	12.38	2.5180	23	20	11.9	1.356
8	2	46	36.80	2.5343	19	25	34.3	8.534	8	4	48	43.38	2.5152	23	21	28.6	1.203
9	2	49	8.91	2.5360	19	34	2.1	8.393	9	4	51	14.20	2.5123	23	22	36.3	1.051
10	2	51	41.12	2.5377	19	42	21.4	8.250	10	4	53	44.85	2.5093	23	23	34.7	0.898
11	2	54	13.43	2.5393	19	50	32.1	8.106	11	4	56	15.32	2.5063	23	24	24.1	0.748
12	2	56	45.84	2.5409	19	58	34.1	7.962	12	4	58	45.60	2.5030	23	25	4.4	0.597
13	2	59	18.34	2.5425	20	6	27.5	7.817	13	5	1	15.68	2.4998	23	25	35.7	0.446
14	3	1	50.94	2.5439	20	14	12.1	7.671	14	5	3	45.57	2.4963	23	25	57.9	0.296
15	3	4	23.61	2.5452	20	21	48.0	7.525	15	5	6	15.24	2.4928	23	26	11.2	+0.147
16	3	6	56.36	2.5464	20	29	15.1	7.377	16	5	8	44.71	2.4893	23	26	15.5	-0.002
17	3	9	29.18	2.5476	20	36	33.2	7.228	17	5	11	13.96	2.4856	23	26	11.0	0.149
18	3	12	2.07	2.5487	20	43	42.5	7.080	18	5	13	42.98	2.4818	23	25	57.6	0.297
19	3	14	35.02	2.5497	20	50	42.8	6.930	19	5	16	11.78	2.4781	23	25	35.4	0.443
20	3	17	8.03	2.5505	20	57	34.1	6.780	20	5	18	40.35	2.4742	23	25	4.4	0.589
21	3	19	41.08	2.5513	21	4	16.4	6.629	21	5	21	8.68	2.4701	23	24	24.7	0.734
22	3	22	14.19	2.5521	21	10	49.6	6.478	22	5	23	36.76	2.4660	23	23	36.3	0.878
23	3	24	47.33	2.5526	21	17	13.7	6.326	23	5	26	4.60	2.4618	23	22	39.3	1.023
24	3	27	20.50	2.5531	+21	23	28.7	+ 6.173	24	5	28	32.18	2.4576	+23	21	33.6	-1.166

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 15.					APRIL 17.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 28 32.18	2.4576	+23 21 33.6	-1.166	0	7 20 32.10	2.1966	+19 59 6.4	-6.870
1	5 30 59.51	2.4533	23 20 19.4	1.307	1	7 22 43.72	2.1908	19 52 11.4	6.963
2	5 33 26.57	2.4488	23 18 56.8	1.448	2	7 24 55.00	2.1850	19 45 10.9	7.054
3	5 35 53.36	2.4443	23 17 25.7	1.589	3	7 27 5.92	2.1792	19 38 4.9	7.145
4	5 38 19.89	2.4398	23 15 46.1	1.728	4	7 29 16.50	2.1733	19 30 53.5	7.234
5	5 40 46.14	2.4352	23 13 58.3	1.867	5	7 31 26.72	2.1675	19 23 36.8	7.323
6	5 43 12.11	2.4305	23 12 2.1	2.004	6	7 33 36.60	2.1618	19 16 14.8	7.409
7	5 45 37.80	2.4258	23 9 57.8	2.141	7	7 35 46.14	2.1561	19 8 47.7	7.496
8	5 48 3.20	2.4208	23 7 45.2	2.278	8	7 37 55.33	2.1503	19 1 15.3	7.582
9	5 50 28.30	2.4160	23 5 24.5	2.413	9	7 40 4.18	2.1446	18 53 37.9	7.665
10	5 52 53.12	2.4111	23 2 55.7	2.547	10	7 42 12.68	2.1388	18 45 55.5	7.748
11	5 55 17.63	2.4060	23 0 18.9	2.679	11	7 44 20.84	2.1333	18 38 8.1	7.831
12	5 57 41.84	2.4010	22 57 34.2	2.811	12	7 46 28.67	2.1277	18 30 15.8	7.912
13	6 0 5.75	2.3958	22 54 41.6	2.943	13	7 48 36.16	2.1220	18 22 18.7	7.992
14	6 2 29.34	2.3907	22 51 41.1	3.073	14	7 50 43.31	2.1164	18 14 16.8	8.070
15	6 4 52.63	2.3855	22 48 32.8	3.203	15	7 52 50.13	2.1109	18 6 10.3	8.148
16	6 7 15.60	2.3802	22 45 16.8	3.331	16	7 54 56.62	2.1054	17 57 59.1	8.225
17	6 9 38.25	2.3748	22 41 53.1	3.458	17	7 57 2.78	2.0999	17 49 43.3	8.301
18	6 12 0.58	2.3695	22 38 21.9	3.583	18	7 59 8.61	2.0944	17 41 23.0	8.376
19	6 14 22.59	2.3641	22 34 43.1	3.709	19	8 1 14.11	2.0890	17 32 58.2	8.450
20	6 16 44.27	2.3586	22 30 56.8	3.833	20	8 3 19.29	2.0836	17 24 29.0	8.523
21	6 19 5.62	2.3531	22 27 3.1	3.956	21	8 5 24.14	2.0782	17 15 55.5	8.594
22	6 21 26.64	2.3476	22 23 2.1	4.078	22	8 7 28.67	2.0729	17 7 17.7	8.665
23	6 23 47.33	2.3420	+22 18 53.8	-4.199	23	8 9 32.89	2.0677	+16 58 35.7	-8.735
APRIL 16.					APRIL 18.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 26 7.68	2.3363	+22 14 38.2	-4.319	0	8 11 36.79	2.0624	+16 49 49.5	-8.804
1	6 28 27.69	2.3308	22 10 15.5	4.438	1	8 13 40.38	2.0572	16 40 59.2	8.872
2	6 30 47.37	2.3251	22 5 45.7	4.555	2	8 15 43.65	2.0520	16 32 4.9	8.939
3	6 33 6.70	2.3193	22 1 8.9	4.673	3	8 17 46.62	2.0469	16 23 6.5	9.006
4	6 35 25.69	2.3137	21 56 25.0	4.788	4	8 19 49.28	2.0418	16 14 4.2	9.070
5	6 37 44.34	2.3079	21 51 34.3	4.902	5	8 21 51.64	2.0368	16 4 58.1	9.134
6	6 40 2.64	2.3021	21 46 36.8	5.015	6	8 23 53.70	2.0318	15 55 48.1	9.198
7	6 42 20.59	2.2963	21 41 32.5	5.128	7	8 25 55.46	2.0269	15 46 34.3	9.260
8	6 44 38.20	2.2906	21 36 21.4	5.240	8	8 27 56.93	2.0220	15 37 16.9	9.321
9	6 46 55.46	2.2848	21 31 3.7	5.349	9	8 29 58.10	2.0172	15 27 55.8	9.383
10	6 49 12.37	2.2789	21 25 39.5	5.458	10	8 31 58.99	2.0123	15 18 31.0	9.442
11	6 51 28.93	2.2731	21 20 8.7	5.567	11	8 33 59.58	2.0075	15 9 2.8	9.500
12	6 53 45.14	2.2672	21 14 31.5	5.673	12	8 35 59.89	2.0028	14 59 31.0	9.558
13	6 56 0.99	2.2613	21 8 47.9	5.779	13	8 37 59.92	1.9982	14 49 55.8	9.615
14	6 58 16.49	2.2554	21 2 58.0	5.883	14	8 39 59.67	1.9936	14 40 17.2	9.671
15	7 0 31.64	2.2495	20 57 1.9	5.987	15	8 41 59.15	1.9890	14 30 35.3	9.727
16	7 2 46.43	2.2437	20 50 59.6	6.089	16	8 43 58.35	1.9844	14 20 50.0	9.781
17	7 5 0.88	2.2378	20 44 51.2	6.191	17	8 45 57.28	1.9800	14 11 1.6	9.834
18	7 7 14.97	2.2318	20 38 36.7	6.292	18	8 47 55.95	1.9756	14 1 9.9	9.887
19	7 9 28.70	2.2260	20 32 16.2	6.391	19	8 49 54.35	1.9712	13 51 15.2	9.938
20	7 11 42.09	2.2202	20 25 49.8	6.488	20	8 51 52.49	1.9669	13 41 17.3	9.990
21	7 13 55.12	2.2143	20 19 17.6	6.586	21	8 53 50.38	1.9627	13 31 16.4	10.040
22	7 16 7.80	2.2084	20 12 39.5	6.682	22	8 55 48.01	1.9584	13 21 12.5	10.089
23	7 18 20.13	2.2025	20 5 55.8	6.776	23	8 57 45.39	1.9543	13 11 5.7	10.138
24	7 20 32.10	2.1966	+19 59 6.4	-6.870	24	8 59 42.52	1.9502	+13 0 56.0	-10.185

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 19.					APRIL 21.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	8 59 42.52	1.9502	+13 0 56.0	-10.185	0	10 29 39.63	1.8203	+4 11 39.9	-11.597
1	9 1 39.41	1.9461	12 50 43.5	10.232	1	10 31 28.81	1.8191	4 0 3.7	11.610
2	9 3 36.05	1.9421	12 40 28.2	10.278	2	10 33 17.92	1.8178	3 48 26.7	11.622
3	9 5 32.46	1.9382	12 30 10.2	10.323	3	10 35 6.95	1.8167	3 36 49.1	11.633
4	9 7 28.63	1.9343	12 19 49.5	10.367	4	10 36 55.92	1.8157	3 25 10.8	11.644
5	9 9 24.57	1.9304	12 9 26.2	10.410	5	10 38 44.83	1.8147	3 13 31.8	11.655
6	9 11 20.28	1.9266	11 59 0.3	10.453	6	10 40 33.68	1.8137	3 1 52.2	11.664
7	9 13 15.76	1.9229	11 48 31.8	10.496	7	10 42 22.47	1.8128	2 50 12.1	11.673
8	9 15 11.03	1.9193	11 38 0.8	10.537	8	10 44 11.21	1.8119	2 38 31.4	11.682
9	9 17 6.07	1.9156	11 27 27.4	10.578	9	10 45 59.90	1.8111	2 26 50.3	11.689
10	9 19 0.90	1.9121	11 16 51.5	10.617	10	10 47 48.54	1.8103	2 15 8.7	11.696
11	9 20 55.52	1.9086	11 6 13.4	10.655	11	10 49 37.14	1.8098	2 3 26.8	11.702
12	9 22 49.93	1.9052	10 55 32.9	10.693	12	10 51 25.71	1.8092	1 51 44.5	11.708
13	9 24 44.14	1.9018	10 44 50.2	10.731	13	10 53 14.24	1.8086	1 40 1.8	11.713
14	9 26 38.14	1.8984	10 34 5.2	10.768	14	10 55 2.74	1.8081	1 28 18.9	11.718
15	9 28 31.95	1.8952	10 23 18.0	10.803	15	10 56 51.21	1.8076	1 16 35.6	11.723
16	9 30 25.56	1.8920	10 12 28.8	10.838	16	10 58 39.65	1.8072	1 4 52.2	11.728
17	9 32 18.99	1.8888	10 1 37.4	10.873	17	11 0 28.07	1.8069	0 53 8.6	11.733
18	9 34 12.22	1.8857	9 50 44.0	10.907	18	11 2 16.48	1.8067	0 41 24.8	11.739
19	9 36 5.27	1.8827	9 39 48.6	10.940	19	11 4 4.87	1.8064	0 29 41.0	11.733
20	9 37 58.14	1.8797	9 28 51.2	10.973	20	11 5 53.25	1.8063	0 17 57.0	11.733
21	9 39 50.83	1.8768	9 17 51.9	11.003	21	11 7 41.63	1.8063	+0 6 13.1	11.733
22	9 41 43.35	1.8739	9 6 50.8	11.034	22	11 9 30.00	1.8062	-0 5 30.9	11.733
23	9 43 35.70	1.8711	+ 8 55 47.8	-11.064	23	11 11 18.37	1.8062	-0 17 14.8	-11.730
APRIL 20.					APRIL 22.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 45 27.88	1.8683	+ 8 44 43.1	-11.093	0	11 13 6.74	1.8063	-0 28 58.5	-11.728
1	9 47 19.90	1.8658	8 33 36.6	11.123	1	11 14 55.12	1.8064	0 40 42.2	11.727
2	9 49 11.77	1.8631	8 22 28.4	11.150	2	11 16 43.51	1.8066	0 52 25.7	11.723
3	9 51 3.47	1.8605	8 11 18.6	11.178	3	11 18 31.91	1.8068	1 4 9.0	11.720
4	9 52 55.03	1.8580	8 0 7.1	11.204	4	11 20 20.33	1.8072	1 15 52.1	11.718
5	9 54 46.43	1.8555	7 48 54.1	11.230	5	11 22 8.77	1.8075	1 27 34.9	11.710
6	9 56 37.69	1.8532	7 37 39.5	11.256	6	11 23 57.23	1.8079	1 39 17.3	11.705
7	9 58 28.81	1.8508	7 26 23.4	11.280	7	11 25 45.72	1.8083	1 50 59.5	11.699
8	10 0 19.79	1.8486	7 15 5.9	11.304	8	11 27 34.23	1.8089	2 2 41.2	11.692
9	10 2 10.64	1.8463	7 3 46.9	11.328	9	11 29 22.79	1.8096	2 14 22.5	11.685
10	10 4 1.35	1.8442	6 52 26.6	11.350	10	11 31 11.38	1.8102	2 26 3.4	11.677
11	10 5 51.94	1.8421	6 41 4.9	11.372	11	11 33 0.01	1.8108	2 37 43.7	11.668
12	10 7 42.40	1.8401	6 29 42.0	11.393	12	11 34 48.68	1.8116	2 49 23.5	11.658
13	10 9 32.75	1.8382	6 18 17.8	11.413	13	11 36 37.40	1.8124	3 1 2.7	11.648
14	10 11 22.98	1.8362	6 6 52.4	11.433	14	11 38 26.17	1.8133	3 12 41.3	11.638
15	10 13 13.09	1.8343	5 55 25.8	11.453	15	11 40 14.99	1.8142	3 24 19.2	11.625
16	10 15 3.10	1.8326	5 43 58.0	11.472	16	11 42 3.87	1.8151	3 35 56.3	11.613
17	10 16 53.00	1.8308	5 32 29.2	11.489	17	11 43 52.80	1.8161	3 47 32.8	11.602
18	10 18 42.79	1.8291	5 20 59.3	11.507	18	11 45 41.80	1.8173	3 59 8.5	11.588
19	10 20 32.49	1.8276	5 9 28.4	11.523	19	11 47 30.87	1.8184	4 10 43.3	11.573
20	10 22 22.10	1.8260	4 57 56.5	11.539	20	11 49 20.01	1.8196	4 22 17.3	11.559
21	10 24 11.61	1.8244	4 46 23.7	11.555	21	11 51 9.22	1.8208	4 33 50.4	11.543
22	10 26 1.03	1.8230	4 34 49.9	11.570	22	11 52 58.51	1.8221	4 45 22.5	11.527
23	10 27 50.37	1.8217	4 23 15.3	11.583	23	11 54 47.87	1.8234	4 56 53.6	11.511
24	10 29 39.63	1.8203	+ 4 11 39.9	-11.597	24	11 56 37.32	1.8248	-5 8 23.8	-11.494

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.
APRIL 23.					APRIL 25.			
	h m s	s	° ' "	"		h m s	s	° ' "
0	11 56 37.32	1.8248	- 5 8 23.8	-11.494	0	13 26 45.20	1.9477	-13 46 32.8
1	11 58 26.85	1.8263	5 19 52.9	11.476	1	13 28 42.17	1.9513	13 56 19.7
2	12 0 16.47	1.8278	5 31 20.9	11.457	2	13 30 39.36	1.9549	14 6 3.8
3	12 2 6.19	1.8293	5 42 47.7	11.438	3	13 32 36.76	1.9584	14 15 43.6
4	12 3 55.99	1.8309	5 54 13.4	11.418	4	13 34 34.37	1.9621	14 25 20.8
5	12 5 45.90	1.8326	6 5 37.8	11.396	5	13 36 32.21	1.9658	14 34 54.6
6	12 7 35.90	1.8343	6 17 0.9	11.375	6	13 38 30.27	1.9695	14 44 24.1
7	12 9 26.01	1.8361	6 28 22.8	11.353	7	13 40 28.55	1.9733	14 53 50.6
8	12 11 16.23	1.8379	6 39 43.3	11.330	8	13 42 27.06	1.9770	15 3 13.8
9	12 13 6.56	1.8398	6 51 2.4	11.306	9	13 44 25.79	1.9808	15 12 32.8
10	12 14 57.00	1.8416	7 2 20.0	11.282	10	13 46 24.75	1.9846	15 21 48.8
11	12 16 47.55	1.8436	7 13 36.2	11.257	11	13 48 23.94	1.9883	15 31 0.4
12	12 18 38.23	1.8457	7 24 50.8	11.231	12	13 50 23.35	1.9922	15 40 8.8
13	12 20 29.03	1.8477	7 36 3.9	11.204	13	13 52 23.00	1.9962	15 49 12.8
14	12 22 19.95	1.8498	7 47 15.3	11.178	14	13 54 22.89	2.0000	15 58 13.8
15	12 24 11.00	1.8519	7 58 25.2	11.150	15	13 56 23.00	2.0039	16 7 9.8
16	12 26 2.18	1.8542	8 9 33.3	11.121	16	13 58 23.36	2.0079	16 16 2.4
17	12 27 53.50	1.8564	8 20 39.7	11.092	17	14 0 23.95	2.0118	16 24 50.8
18	12 29 44.95	1.8587	8 31 44.3	11.062	18	14 2 24.78	2.0158	16 33 35.8
19	12 31 36.54	1.8610	8 42 47.1	11.032	19	14 4 25.85	2.0199	16 42 15.6
20	12 33 28.27	1.8634	8 53 48.1	11.000	20	14 6 27.17	2.0239	16 50 51.8
21	12 35 20.15	1.8659	9 4 47.1	10.968	21	14 8 28.72	2.0279	16 59 23.6
22	12 37 12.18	1.8683	9 15 44.2	10.935	22	14 10 30.52	2.0319	17 7 51.2
23	12 39 4.35	1.8708	- 9 26 39.3	-10.901	23	14 12 32.55	2.0360	-17 16 14.8
APRIL 24.					APRIL 26.			
	h m s	s	° ' "	"		h m s	s	° ' "
0	12 40 56.68	1.8735	- 9 37 32.3	-10.867	0	14 14 34.84	2.0402	-17 24 33.8
1	12 42 49.17	1.8761	9 48 23.3	10.832	1	14 16 37.37	2.0443	17 32 47.7
2	12 44 41.81	1.8788	9 59 12.1	10.795	2	14 18 40.15	2.0483	17 40 57.7
3	12 46 34.62	1.8815	10 9 58.7	10.758	3	14 20 43.17	2.0524	17 49 3.6
4	12 48 27.59	1.8842	10 20 43.1	10.722	4	14 22 46.44	2.0565	17 57 3.8
5	12 50 20.72	1.8870	10 31 25.3	10.683	5	14 24 49.95	2.0607	18 4 59.8
6	12 52 14.03	1.8900	10 42 5.1	10.644	6	14 26 53.72	2.0648	18 12 51.4
7	12 54 7.50	1.8928	10 52 42.6	10.605	7	14 28 57.73	2.0690	18 20 38.6
8	12 56 1.16	1.8958	11 3 17.7	10.564	8	14 31 2.00	2.0732	18 28 19.6
9	12 57 54.99	1.8986	11 13 50.3	10.523	9	14 33 6.51	2.0773	18 35 56.8
10	12 59 48.99	1.9016	11 24 20.4	10.481	10	14 35 11.27	2.0814	18 43 29.1
11	13 1 43.18	1.9047	11 34 48.0	10.438	11	14 37 16.28	2.0855	18 50 56.8
12	13 3 37.55	1.9078	11 45 12.9	10.393	12	14 39 21.53	2.0897	18 58 18.8
13	13 5 32.11	1.9109	11 55 35.2	10.350	13	14 41 27.04	2.0938	19 5 35.4
14	13 7 26.86	1.9141	12 5 54.9	10.305	14	14 43 32.79	2.0980	19 12 47.8
15	13 9 21.80	1.9173	12 16 11.8	10.258	15	14 45 38.80	2.1022	19 19 54.1
16	13 11 16.93	1.9204	12 26 25.9	10.212	16	14 47 45.05	2.1063	19 26 55.7
17	13 13 12.25	1.9238	12 36 37.2	10.164	17	14 49 51.55	2.1104	19 33 52.6
18	13 15 7.78	1.9272	12 46 45.6	10.116	18	14 51 58.30	2.1146	19 40 43.6
19	13 17 3.51	1.9304	12 56 51.1	10.067	19	14 54 5.30	2.1187	19 47 28.6
20	13 18 59.43	1.9338	13 6 53.6	10.016	20	14 56 12.54	2.1228	19 54 8.8
21	13 20 55.56	1.9373	13 16 53.0	9.965	21	14 58 20.04	2.1269	20 0 43.8
22	13 22 51.90	1.9408	13 26 49.4	9.914	22	15 0 27.77	2.1310	20 7 12.8
23	13 24 48.45	1.9442	13 36 42.7	9.862	23	15 2 35.76	2.1351	20 13 36.8
24	13 26 45.20	1.9477	-13 46 32.8	-9.808	24	15 4 43.98	2.1391	-20 19 54.8

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 27.					APRIL 29.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 4 43.98	2.1391	-20 19 54.4	-6.253	0	16 51 33.17	2.2953	-23 17 30.6	-0.900
1	15 6 52.45	2.1433	20 26 6.8	6.158	1	16 53 50.95	2.2973	23 18 20.9	0.775
2	15 9 1.17	2.1473	20 32 13.4	6.063	2	16 56 8.84	2.2992	23 19 3.6	0.649
3	15 11 10.12	2.1513	20 38 14.3	5.967	3	16 58 26.85	2.3011	23 19 38.8	0.524
4	15 13 19.32	2.1553	20 44 9.4	5.868	4	17 0 44.97	2.3029	23 20 6.5	0.398
5	15 15 28.76	2.1593	20 49 58.5	5.770	5	17 3 2.20	2.3047	23 20 26.6	0.271
6	15 17 38.43	2.1633	20 55 41.8	5.672	6	17 5 31.53	2.3063	23 20 39.0	0.144
7	15 19 48.35	2.1672	21 1 19.1	5.573	7	17 7 39.96	2.3080	23 20 43.9	-0.018
8	15 21 58.49	2.1711	21 6 50.5	5.472	8	17 9 58.49	2.3096	23 20 41.2	+0.109
9	15 24 8.88	2.1750	21 12 15.7	5.370	9	17 12 17.11	2.3110	23 20 30.8	0.237
10	15 26 19.49	2.1788	21 17 34.9	5.268	10	17 14 35.81	2.3124	23 20 12.8	0.364
11	15 28 30.34	2.1827	21 22 47.9	5.165	11	17 16 54.60	2.3138	23 19 47.1	0.493
12	15 30 41.41	2.1864	21 27 54.7	5.062	12	17 19 13.46	2.3150	23 19 13.7	0.621
13	15 32 52.71	2.1903	21 32 55.3	4.958	13	17 21 32.40	2.3163	23 18 32.6	0.748
14	15 35 4.24	2.1941	21 37 49.6	4.853	14	17 23 51.42	2.3175	23 17 43.9	0.877
15	15 37 16.00	2.1978	21 42 37.6	4.747	15	17 26 10.50	2.3186	23 16 47.4	1.006
16	15 39 27.97	2.2014	21 47 19.2	4.640	16	17 28 29.65	2.3196	23 15 43.2	1.135
17	15 41 40.17	2.2051	21 51 54.4	4.533	17	17 30 48.85	2.3205	23 14 31.2	1.264
18	15 43 52.58	2.2087	21 56 23.1	4.424	18	17 33 8.11	2.3214	23 13 11.5	1.393
19	15 46 5.21	2.2123	22 0 45.3	4.317	19	17 35 27.42	2.3223	23 11 44.1	1.522
20	15 48 18.05	2.2158	22 5 1.1	4.208	20	17 37 46.78	2.3230	23 10 8.9	1.651
21	15 50 31.10	2.2193	22 9 10.2	4.097	21	17 40 6.18	2.3237	23 8 26.0	1.779
22	15 52 44.36	2.2228	22 13 12.7	3.986	22	17 42 25.62	2.3243	23 6 35.4	1.908
23	15 54 57.83	2.2262	-22 17 8.5	-3.874	23	17 44 45.09	2.3248	-23 4 37.0	+2.038
APRIL 28.					APRIL 30.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 57 11.50	2.2295	-22 20 57.6	-3.763	0	17 47 4.59	2.3253	-23 2 30.8	+2.168
1	15 59 25.37	2.2329	22 24 40.0	3.649	1	17 49 24.12	2.3258	23 0 16.9	2.298
2	16 1 39.45	2.2362	22 28 15.5	3.536	2	17 51 43.68	2.3262	22 57 55.1	2.427
3	16 3 53.71	2.2393	22 31 44.3	3.423	3	17 54 3.26	2.3264	22 55 25.7	2.555
4	16 6 8.17	2.2427	22 35 6.2	3.308	4	17 56 22.85	2.3266	22 52 48.5	2.685
5	16 8 22.83	2.2458	22 38 21.2	3.192	5	17 58 42.45	2.3268	22 50 3.5	2.814
6	16 10 37.66	2.2488	22 41 29.2	3.076	6	18 1 2.06	2.3269	22 47 10.8	2.943
7	16 12 52.69	2.2519	22 44 30.3	2.960	7	18 3 21.68	2.3270	22 44 10.4	3.071
8	16 15 7.89	2.2549	22 47 24.4	2.843	8	18 5 41.30	2.3269	22 41 2.3	3.200
9	16 17 23.28	2.2579	22 50 11.4	2.725	9	18 8 0.91	2.3268	22 37 46.4	3.329
10	16 19 38.84	2.2608	22 52 51.4	2.608	10	18 10 20.52	2.3268	22 34 22.8	3.458
11	16 21 54.57	2.2635	22 55 24.3	2.488	11	18 12 40.12	2.3265	22 30 51.5	3.585
12	16 24 10.46	2.2663	22 57 50.0	2.368	12	18 14 59.70	2.3263	22 27 12.6	3.713
13	16 26 26.53	2.2691	23 0 8.5	2.249	13	18 17 19.27	2.3259	22 23 25.9	3.842
14	16 28 42.75	2.2718	23 2 19.9	2.129	14	18 19 38.81	2.3255	22 19 31.6	3.969
15	16 30 59.14	2.2744	23 4 24.0	2.008	15	18 21 58.33	2.3252	22 15 29.6	4.098
16	16 33 15.68	2.2769	23 6 20.8	1.887	16	18 24 17.83	2.3247	22 11 19.9	4.224
17	16 35 32.37	2.2794	23 8 10.4	1.765	17	18 26 37.29	2.3241	22 7 2.7	4.351
18	16 37 49.21	2.2819	23 9 52.6	1.642	18	18 28 56.72	2.3235	22 2 37.8	4.478
19	16 40 6.20	2.2843	23 11 27.4	1.519	19	18 31 16.11	2.3228	21 58 5.3	4.605
20	16 42 23.33	2.2866	23 12 54.9	1.397	20	18 33 35.46	2.3222	21 53 25.2	4.731
21	16 44 40.59	2.2888	23 14 15.0	1.273	21	18 35 54.77	2.3214	21 48 37.6	4.856
22	16 46 57.99	2.2910	23 15 27.7	1.149	22	18 38 14.03	2.3207	21 43 42.5	4.982
23	16 49 15.51	2.2932	23 16 32.9	1.024	23	18 40 33.25	2.3198	21 38 39.8	5.108
24	16 51 33.17	2.2953	-23 17 30.6	-0.900	24	18 42 52.40	2.3188	-21 33 29.6	+5.233

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 1.					MAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	18 42 52.40	2.3188	-21 33 29.6	+ 5.233	0	20 32 32.97	2.2450	-15 8 25.3	+10.557
1	18 45 11.51	2.3180	21 28 11.9	5.357	1	20 34 47.62	2.2434	14 57 49.1	10.650
2	18 47 30.56	2.3170	21 22 46.8	5.480	2	20 37 2.18	2.2418	14 47 7.3	10.742
3	18 49 49.55	2.3159	21 17 14.3	5.604	3	20 39 16.64	2.2402	14 36 20.1	10.832
4	18 52 8.47	2.3148	21 11 34.3	5.728	4	20 41 31.00	2.2386	14 25 27.5	10.922
5	18 54 27.33	2.3138	21 5 46.9	5.851	5	20 43 45.27	2.2370	14 14 29.5	11.011
6	18 56 46.13	2.3127	20 59 52.2	5.973	6	20 45 59.44	2.2355	14 3 26.2	11.098
7	18 59 4.85	2.3114	20 53 50.2	6.095	7	20 48 13.53	2.2340	13 52 17.7	11.186
8	19 1 23.50	2.3102	20 47 40.8	6.217	8	20 50 27.52	2.2325	13 41 3.9	11.272
9	19 3 42.07	2.3089	20 41 24.2	6.337	9	20 52 41.43	2.2311	13 29 45.1	11.356
10	19 6 0.57	2.3077	20 35 0.4	6.458	10	20 54 55.25	2.2296	13 18 21.2	11.441
11	19 8 18.99	2.3063	20 28 29.3	6.578	11	20 57 8.98	2.2282	13 6 52.2	11.524
12	19 10 37.32	2.3048	20 21 51.0	6.698	12	20 59 22.63	2.2268	12 55 18.3	11.606
13	19 12 55.57	2.3035	20 15 5.6	6.816	13	21 1 36.20	2.2255	12 43 39.5	11.687
14	19 15 13.74	2.3021	20 8 13.1	6.935	14	21 3 49.69	2.2242	12 31 55.9	11.767
15	19 17 31.82	2.3006	20 1 13.4	7.052	15	21 6 3.10	2.2229	12 20 7.5	11.846
16	19 19 49.81	2.2992	19 54 6.8	7.170	16	21 8 16.44	2.2217	12 8 14.4	11.924
17	19 22 7.72	2.2977	19 46 53.0	7.287	17	21 10 29.70	2.2204	11 56 16.6	12.001
18	19 24 25.53	2.2960	19 39 32.4	7.403	18	21 12 42.89	2.2193	11 44 14.3	12.077
19	19 26 43.24	2.2944	19 32 4.7	7.518	19	21 14 56.01	2.2181	11 32 7.4	12.153
20	19 29 0.86	2.2929	19 24 30.2	7.633	20	21 17 9.06	2.2170	11 19 56.0	12.226
21	19 31 18.39	2.2913	19 16 48.7	7.748	21	21 19 22.05	2.2159	11 7 40.3	12.299
22	19 33 35.82	2.2897	19 9 0.5	7.861	22	21 21 34.97	2.2148	10 55 20.1	12.371
23	19 35 53.15	2.2881	-19 1 5.4	+ 7.974	23	21 23 47.83	2.2139	-10 42 55.8	+12.442
MAY 2.					MAY 4.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	19 38 10.39	2.2864	-18 53 3.6	+ 8.086	0	21 26 0.64	2.2130	-10 30 27.1	+12.512
1	19 40 27.52	2.2848	18 44 55.1	8.198	1	21 28 13.39	2.2121	10 17 54.4	12.579
2	19 42 44.56	2.2831	18 36 39.9	8.309	2	21 30 26.09	2.2112	10 5 17.6	12.647
3	19 45 1.49	2.2813	18 28 18.0	8.420	3	21 32 38.73	2.2103	9 52 36.8	12.713
4	19 47 18.32	2.2796	18 19 49.5	8.529	4	21 34 51.33	2.2096	9 39 52.0	12.778
5	19 49 35.04	2.2779	18 11 14.5	8.638	5	21 37 3.88	2.2089	9 27 3.4	12.843
6	19 51 51.67	2.2762	18 2 33.0	8.746	6	21 39 16.40	2.2083	9 14 10.9	12.906
7	19 54 8.18	2.2743	17 53 45.0	8.853	7	21 41 28.87	2.2075	9 1 14.7	12.968
8	19 56 24.59	2.2727	17 44 50.6	8.960	8	21 43 41.30	2.2069	8 48 14.8	13.028
9	19 58 40.90	2.2709	17 35 49.8	9.066	9	21 45 53.70	2.2064	8 35 11.3	13.088
10	20 0 57.10	2.2692	17 26 42.7	9.171	10	21 48 6.07	2.2059	8 22 4.3	13.146
11	20 3 13.20	2.2674	17 17 29.3	9.276	11	21 50 18.41	2.2054	8 8 53.8	13.203
12	20 5 29.19	2.2657	17 8 9.6	9.379	12	21 52 30.72	2.2050	7 55 39.9	13.259
13	20 7 45.08	2.2639	16 58 43.8	9.482	13	21 54 43.01	2.2048	7 42 22.7	13.314
14	20 10 0.86	2.2622	16 49 11.8	9.584	14	21 56 55.29	2.2044	7 29 2.2	13.368
15	20 12 16.54	2.2604	16 39 33.7	9.685	15	21 59 7.54	2.2042	7 15 38.6	13.420
16	20 14 32.11	2.2587	16 29 49.6	9.785	16	22 1 19.79	2.2040	7 2 11.8	13.471
17	20 16 47.58	2.2569	16 19 59.5	9.884	17	22 3 32.02	2.2038	6 48 42.1	13.521
18	20 19 2.94	2.2552	16 10 3.5	9.983	18	22 5 44.25	2.2038	6 35 9.3	13.570
19	20 21 18.20	2.2535	16 0 1.6	10.081	19	22 7 56.48	2.2038	6 21 33.7	13.618
20	20 23 33.36	2.2518	15 49 53.8	10.178	20	22 10 8.71	2.2038	6 7 55.2	13.664
21	20 25 48.42	2.2501	15 39 40.2	10.274	21	22 12 20.94	2.2039	5 54 14.0	13.709
22	20 28 3.37	2.2483	15 29 20.9	10.369	22	22 14 33.18	2.2040	5 40 30.1	13.753
23	20 30 18.22	2.2467	15 18 55.9	10.463	23	22 16 45.42	2.2042	5 26 43.6	13.796
24	20 32 32.97	2.2450	-15 8 25.3	+10.557	24	22 18 57.68	2.2045	-5 12 54.6	+13.837

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 5.					MAY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 18 57.68	2.2045	-5 12 54.6	+13.837	0	0 6 11.98	2.2865	+6 12 31.3	+14.153
1	22 21 9.96	2.2048	4 59 3.2	13.877	1	0 8 29.26	2.2897	6 26 39.5	14.120
2	22 23 22.26	2.2052	4 45 9.4	13.915	2	0 10 46.74	2.2928	6 40 45.7	14.088
3	22 25 34.58	2.2056	4 31 13.4	13.953	3	0 13 4.40	2.2959	6 54 50.0	14.053
4	22 27 46.93	2.2061	4 17 15.1	13.989	4	0 15 22.25	2.2993	7 8 52.0	14.016
5	22 29 59.31	2.2067	4 3 14.7	14.023	5	0 17 40.31	2.3026	7 22 51.9	13.978
6	22 32 11.73	2.2073	3 49 12.3	14.057	6	0 19 58.56	2.3058	7 36 49.4	13.938
7	22 34 24.18	2.2078	3 35 7.9	14.089	7	0 22 17.01	2.3093	7 50 44.4	13.896
8	22 36 36.67	2.2087	3 21 1.6	14.120	8	0 24 35.67	2.3128	8 4 36.9	13.853
9	22 38 49.22	2.2095	3 6 53.5	14.149	9	0 26 54.54	2.3162	8 18 26.8	13.808
10	22 41 1.81	2.2103	2 52 43.7	14.178	10	0 29 13.61	2.3197	8 32 13.9	13.762
11	22 43 14.45	2.2111	2 38 32.2	14.204	11	0 31 32.90	2.3232	8 45 58.2	13.713
12	22 45 27.14	2.2121	2 24 19.2	14.229	12	0 33 52.39	2.3267	8 59 39.4	13.662
13	22 47 39.90	2.2132	2 10 4.7	14.253	13	0 36 12.10	2.3304	9 13 17.6	13.611
14	22 49 52.72	2.2142	1 55 48.8	14.276	14	0 38 32.04	2.3341	9 26 52.7	13.558
15	22 52 5.60	2.2153	1 41 31.6	14.297	15	0 40 52.19	2.3378	9 40 24.5	13.502
16	22 54 18.56	2.2166	1 27 13.2	14.316	16	0 43 12.57	2.3415	9 53 52.9	13.445
17	22 56 31.59	2.2178	1 12 53.7	14.334	17	0 45 33.17	2.3453	10 7 17.9	13.387
18	22 58 44.70	2.2192	0 58 33.1	14.352	18	0 47 54.00	2.3490	10 20 39.3	13.326
19	23 0 57.89	2.2206	0 44 11.5	14.368	19	0 50 15.05	2.3528	10 33 57.0	13.264
20	23 3 11.17	2.2220	0 29 49.0	14.382	20	0 52 36.34	2.3568	10 47 11.0	13.200
21	23 5 24.53	2.2235	0 15 25.7	14.394	21	0 54 57.86	2.3606	11 0 21.0	13.134
22	23 7 37.99	2.2251	-0 1 1.7	14.405	22	0 57 19.61	2.3644	11 13 27.1	13.068
23	23 9 51.54	2.2267	+0 13 22.9	+14.414	23	0 59 41.59	2.3683	+11 26 29.1	+12.998
MAY 6.					MAY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 12 5.19	2.2283	+0 27 48.0	+14.423	0	1 2 3.81	2.3723	+11 39 26.9	+12.928
1	23 14 18.94	2.2302	0 42 13.6	14.429	1	1 4 26.27	2.3763	11 52 20.4	12.855
2	23 16 32.81	2.2320	0 56 39.5	14.434	2	1 6 48.97	2.3803	12 5 9.5	12.780
3	23 18 46.78	2.2338	1 11 5.7	14.438	3	1 9 11.91	2.3843	12 17 54.0	12.704
4	23 21 0.86	2.2358	1 25 32.0	14.440	4	1 11 35.09	2.3883	12 30 34.0	12.628
5	23 23 15.07	2.2378	1 39 58.5	14.441	5	1 13 58.51	2.3923	12 43 9.3	12.548
6	23 25 29.39	2.2398	1 54 24.9	14.439	6	1 16 22.17	2.3964	12 55 39.7	12.466
7	23 27 43.84	2.2419	2 8 51.2	14.437	7	1 18 46.08	2.4005	13 8 5.2	12.383
8	23 29 58.42	2.2441	2 23 17.3	14.433	8	1 21 10.23	2.4046	13 20 25.7	12.299
9	23 32 13.13	2.2463	2 37 43.2	14.428	9	1 23 34.62	2.4086	13 32 41.1	12.213
10	23 34 27.98	2.2486	2 52 8.6	14.420	10	1 25 59.26	2.4127	13 44 51.3	12.125
11	23 36 42.96	2.2509	3 6 33.6	14.412	11	1 28 24.14	2.4167	13 56 56.1	12.035
12	23 38 58.09	2.2533	3 20 58.0	14.401	12	1 30 49.26	2.4208	14 8 55.5	11.944
13	23 41 13.36	2.2558	3 35 21.7	14.389	13	1 33 14.63	2.4248	14 20 49.4	11.852
14	23 43 28.79	2.2583	3 49 44.7	14.376	14	1 35 40.24	2.4288	14 32 37.7	11.757
15	23 45 44.36	2.2609	4 4 6.8	14.361	15	1 38 6.09	2.4329	14 44 20.2	11.660
16	23 48 0.10	2.2636	4 18 28.0	14.344	16	1 40 32.19	2.4370	14 55 56.9	11.563
17	23 50 15.99	2.2663	4 32 48.1	14.325	17	1 42 58.53	2.4410	15 7 27.7	11.463
18	23 52 32.05	2.2690	4 47 7.0	14.306	18	1 45 25.11	2.4450	15 18 52.5	11.363
19	23 54 48.27	2.2718	5 1 24.8	14.285	19	1 47 51.93	2.4490	15 30 11.2	11.260
20	23 57 4.66	2.2746	5 15 41.2	14.261	20	1 50 18.99	2.4530	15 41 23.7	11.155
21	23 59 21.22	2.2775	5 29 56.1	14.236	21	1 52 46.29	2.4570	15 52 29.8	11.049
22	0 1 37.96	2.2805	5 44 9.5	14.209	22	1 55 13.83	2.4609	16 3 29.6	10.943
23	0 3 54.88	2.2835	5 58 21.2	14.182	23	1 57 41.60	2.4648	16 14 22.9	10.833
24	0 6 11.98	2.2865	+6 12 31.3	+14.163	24	2 0 9.60	2.4687	+16 25 9.6	+10.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 9.					MAY 11.				
	h m s	s	" "	" "		h m s	s	" "	" "
0	2 0 9.60	2.4687	+16 25 9.6	+10.723	0	4 2 4.50	2.5793	+22 27 52.9	+4.011
1	2 2 37.84	2.4726	16 35 49.6	10.611	1	4 4 39.25	2.5792	22 31 48.8	3.853
2	2 5 6.31	2.4764	16 46 22.9	10.498	2	4 7 14.00	2.5790	22 35 35.3	3.695
3	2 7 35.01	2.4802	16 56 49.3	10.382	3	4 9 48.73	2.5786	22 39 12.2	3.536
4	2 10 3.93	2.4839	17 7 8.7	10.266	4	4 12 23.43	2.5781	22 42 39.6	3.378
5	2 12 33.08	2.4878	17 17 21.2	10.148	5	4 14 58.10	2.5775	22 45 57.5	3.219
6	2 15 2.46	2.4914	17 27 26.4	10.028	6	4 17 32.73	2.5768	22 49 5.9	3.060
7	2 17 32.05	2.4950	17 37 24.5	9.908	7	4 20 7.32	2.5760	22 52 4.7	2.902
8	2 20 1.86	2.4986	17 47 15.3	9.785	8	4 22 41.85	2.5750	22 54 54.1	2.743
9	2 22 31.88	2.5021	17 56 58.7	9.661	9	4 25 16.32	2.5739	22 57 33.9	2.583
10	2 25 2.11	2.5056	18 6 34.6	9.536	10	4 27 50.72	2.5727	23 0 4.1	2.425
11	2 27 32.55	2.5091	18 16 3.0	9.409	11	4 30 25.04	2.5714	23 2 24.9	2.267
12	2 30 3.20	2.5125	18 25 23.7	9.282	12	4 32 59.29	2.5700	23 4 36.1	2.108
13	2 32 34.05	2.5158	18 34 36.8	9.153	13	4 35 33.44	2.5684	23 6 37.8	1.949
14	2 35 5.10	2.5191	18 43 42.0	9.022	14	4 38 7.50	2.5667	23 8 30.0	1.792
15	2 37 36.34	2.5223	18 52 39.4	8.891	15	4 40 41.44	2.5648	23 10 12.8	1.633
16	2 40 7.77	2.5254	19 1 28.9	8.758	16	4 43 15.28	2.5629	23 11 46.0	1.476
17	2 42 39.39	2.5285	19 10 10.4	8.623	17	4 45 48.99	2.5608	23 13 9.9	1.318
18	2 45 11.19	2.5315	19 18 43.7	8.488	18	4 48 22.58	2.5587	23 14 24.2	1.161
19	2 47 43.17	2.5344	19 27 9.0	8.353	19	4 50 56.03	2.5563	23 15 29.2	1.005
20	2 50 15.32	2.5373	19 35 26.0	8.214	20	4 53 29.34	2.5540	23 16 24.8	0.848
21	2 52 47.64	2.5401	19 43 34.7	8.075	21	4 56 2.51	2.5514	23 17 11.0	0.692
22	2 55 20.13	2.5428	19 51 35.0	7.935	22	4 58 35.51	2.5488	23 17 47.8	0.537
23	2 57 52.77	2.5453	+19 59 26.9	+7.794	23	5 1 8.36	2.5460	+23 18 15.4	+0.382
MAY 10.					MAY 12.				
	h m s	s	" "	" "		h m s	s	" "	" "
0	3 0 25.57	2.5479	+20 7 10.3	+7.653	0	5 3 41.03	2.5431	+23 18 33.6	+0.227
1	3 2 58.52	2.5504	20 14 45.2	7.509	1	5 6 13.53	2.5401	23 18 42.6	+0.073
2	3 5 31.62	2.5528	20 22 11.4	7.365	2	5 8 45.84	2.5369	23 18 42.4	-0.081
3	3 8 4.86	2.5551	20 29 29.0	7.221	3	5 11 17.96	2.5337	23 18 32.9	0.234
4	3 10 38.23	2.5572	20 36 37.9	7.075	4	5 13 49.88	2.5303	23 18 14.3	0.386
5	3 13 11.72	2.5593	20 43 38.0	6.928	5	5 16 21.60	2.5269	23 17 46.6	0.538
6	3 15 45.34	2.5613	20 50 29.3	6.781	6	5 18 53.11	2.5233	23 17 9.8	0.688
7	3 18 19.08	2.5633	20 57 11.7	6.632	7	5 21 24.40	2.5197	23 16 24.0	0.839
8	3 20 52.93	2.5651	21 3 45.1	6.483	8	5 23 55.47	2.5159	23 15 29.1	0.989
9	3 23 26.89	2.5668	21 10 9.6	6.333	9	5 26 26.31	2.5121	23 14 25.3	1.138
10	3 26 0.94	2.5683	21 16 25.1	6.183	10	5 28 56.92	2.5082	23 13 12.6	1.285
11	3 28 35.09	2.5698	21 22 31.5	6.031	11	5 31 27.29	2.5041	23 11 51.1	1.433
12	3 31 9.32	2.5713	21 28 28.8	5.878	12	5 33 57.41	2.4999	23 10 20.7	1.580
13	3 33 43.64	2.5725	21 34 16.9	5.726	13	5 36 27.28	2.4956	23 8 41.5	1.725
14	3 36 18.02	2.5737	21 39 55.9	5.573	14	5 38 56.88	2.4913	23 6 53.7	1.870
15	3 38 52.48	2.5748	21 45 25.6	5.418	15	5 41 26.23	2.4868	23 4 57.1	2.014
16	3 41 26.99	2.5757	21 50 46.0	5.263	16	5 43 55.30	2.4823	23 2 52.0	2.157
17	3 44 1.56	2.5766	21 55 57.2	5.108	17	5 46 24.10	2.4777	23 0 38.3	2.299
18	3 46 36.18	2.5773	22 0 59.0	4.953	18	5 48 52.62	2.4729	22 58 16.1	2.441
19	3 49 10.84	2.5779	22 5 51.5	4.798	19	5 51 20.85	2.4682	22 55 45.4	2.581
20	3 51 45.53	2.5784	22 10 34.7	4.641	20	5 53 48.80	2.4633	22 53 6.4	2.720
21	3 54 20.25	2.5788	22 15 8.4	4.483	21	5 56 16.45	2.4583	22 50 19.0	2.859
22	3 56 54.99	2.5791	22 19 32.7	4.326	22	5 58 43.80	2.4533	22 47 23.3	2.996
23	3 59 29.74	2.5793	22 23 47.5	4.168	23	6 1 10.84	2.4482	22 44 19.5	3.132
24	4 2 4.50	2.5793	+22 27 52.9	+4.011	24	6 3 37.58	2.4430	+22 41 7.5	-3.268

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 13.					MAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	6 3 37.58	2.4430	+22 41 7.5	-3.268	0	7 54 6.30	2.1538	+17 50 8.5	-8.308
1	6 6 4.00	2.4378	22 37 47.4	3.403	1	7 56 15.35	2.1479	17 41 42.3	8.475
2	6 8 30.11	2.4325	22 34 19.2	3.536	2	7 58 24.05	2.1419	17 33 11.5	8.552
3	6 10 55.90	2.4271	22 30 43.1	3.667	3	8 0 32.38	2.1359	17 24 36.1	8.628
4	6 13 21.36	2.4217	22 26 59.2	3.798	4	8 2 40.36	2.1300	17 15 56.2	8.702
5	6 15 46.50	2.4162	22 23 7.3	3.929	5	8 4 47.98	2.1241	17 7 11.9	8.775
6	6 18 11.30	2.4106	22 19 7.7	4.058	6	8 6 55.25	2.1183	16 58 23.2	8.848
7	6 20 35.77	2.4050	22 15 0.4	4.185	7	8 9 2.17	2.1124	16 49 30.2	8.918
8	6 22 59.90	2.3993	22 10 45.5	4.312	8	8 11 8.74	2.1067	16 40 33.0	8.988
9	6 25 23.68	2.3936	22 6 23.0	4.438	9	8 13 14.97	2.1008	16 31 31.6	9.057
10	6 27 47.13	2.3878	22 1 53.0	4.562	10	8 15 20.84	2.0951	16 22 26.2	9.124
11	6 30 10.22	2.3819	21 57 15.6	4.685	11	8 17 26.38	2.0894	16 13 16.7	9.192
12	6 32 32.96	2.3761	21 52 30.8	4.807	12	8 19 31.57	2.0838	16 4 3.2	9.258
13	6 34 55.35	2.3703	21 47 38.8	4.928	13	8 21 36.43	2.0782	15 54 45.8	9.322
14	6 37 17.39	2.3643	21 42 39.5	5.048	14	8 23 40.95	2.0727	15 45 24.6	9.384
15	6 39 39.06	2.3583	21 37 33.1	5.166	15	8 25 45.15	2.0672	15 35 59.7	9.447
16	6 42 0.38	2.3523	21 32 19.6	5.283	16	8 27 49.01	2.0617	15 26 31.0	9.509
17	6 44 21.34	2.3463	21 26 59.2	5.398	17	8 29 52.55	2.0563	15 16 58.6	9.569
18	6 46 41.93	2.3402	21 21 31.8	5.514	18	8 31 55.76	2.0508	15 7 22.7	9.628
19	6 49 2.16	2.3341	21 15 57.5	5.628	19	8 33 58.65	2.0456	14 57 43.2	9.687
20	6 51 22.02	2.3279	21 10 16.5	5.739	20	8 36 1.23	2.0403	14 48 0.3	9.744
21	6 53 41.51	2.3218	21 4 28.8	5.851	21	8 38 3.49	2.0350	14 38 13.9	9.801
22	6 56 0.63	2.3155	20 58 34.4	5.962	22	8 40 5.43	2.0298	14 28 24.2	9.855
23	6 58 19.37	2.3093	+20 52 33.4	-6.070	23	8 42 7.07	2.0248	+14 18 31.3	-9.910
MAY 14.					MAY 16.				
0	7 0 37.75	2.3032	+20 46 26.0	-6.178	0	8 44 8.40	2.0197	+14 8 35.0	-9.964
1	7 2 55.75	2.2969	20 40 12.1	6.284	1	8 46 9.43	2.0147	13 58 35.6	10.018
2	7 5 13.38	2.2908	20 33 51.9	6.389	2	8 48 10.16	2.0097	13 48 33.1	10.068
3	7 7 30.64	2.2844	20 27 25.4	6.493	3	8 50 10.59	2.0048	13 38 27.4	10.119
4	7 9 47.51	2.2782	20 20 52.7	6.596	4	8 52 10.73	1.9999	13 28 18.8	10.168
5	7 12 4.02	2.2719	20 14 13.9	6.698	5	8 54 10.58	1.9951	13 18 7.3	10.217
6	7 14 20.14	2.2656	20 7 29.0	6.798	6	8 56 10.14	1.9903	13 7 52.8	10.265
7	7 16 35.89	2.2594	20 0 38.1	6.898	7	8 58 9.42	1.9856	12 57 35.5	10.312
8	7 18 51.27	2.2531	19 53 41.3	6.995	8	9 0 8.41	1.9809	12 47 15.4	10.358
9	7 21 6.26	2.2468	19 46 38.7	7.092	9	9 2 7.13	1.9764	12 36 52.6	10.402
10	7 23 20.88	2.2405	19 39 30.3	7.187	10	9 4 5.58	1.9719	12 26 27.2	10.446
11	7 25 35.12	2.2343	19 32 16.3	7.281	11	9 6 3.76	1.9674	12 15 59.1	10.490
12	7 27 48.99	2.2280	19 24 56.6	7.374	12	9 8 1.67	1.9630	12 5 28.4	10.533
13	7 30 2.48	2.2217	19 17 31.4	7.466	13	9 9 59.32	1.9587	11 54 55.2	10.573
14	7 32 15.59	2.2154	19 10 0.7	7.557	14	9 11 56.71	1.9543	11 44 19.6	10.614
15	7 34 28.33	2.2093	19 2 24.6	7.646	15	9 13 53.84	1.9501	11 33 41.5	10.654
16	7 36 40.70	2.2031	18 54 43.2	7.734	16	9 15 50.72	1.9459	11 23 1.1	10.693
17	7 38 52.70	2.1968	18 46 56.5	7.821	17	9 17 47.35	1.9418	11 12 18.3	10.733
18	7 41 4.32	2.1906	18 39 4.7	7.907	18	9 19 43.73	1.9378	11 1 33.3	10.769
19	7 43 15.57	2.1844	18 31 7.7	7.993	19	9 21 39.88	1.9338	10 50 46.0	10.806
20	7 45 26.45	2.1783	18 23 5.6	8.075	20	9 23 35.78	1.9298	10 39 56.6	10.841
21	7 47 36.96	2.1722	18 14 58.7	8.157	21	9 25 31.45	1.9259	10 29 5.1	10.876
22	7 49 47.11	2.1661	18 6 46.8	8.239	22	9 27 26.89	1.9222	10 18 11.5	10.910
23	7 51 56.89	2.1599	17 58 30.0	8.319	23	9 29 22.11	1.9184	10 7 15.9	10.943
24	7 54 6.30	2.1538	+17 50 8.5	-8.398	24	9 31 17.10	1.9147	+9 56 18.3	-10.977

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 17.					MAY 19.				
	h m s	s	" "	" "		h m s	s	" "	" "
0	9 31 17.10	1.9147	+9 56 18.3	-10.976	0	11 0 9.65	1.8133	+0 45 34.3	-11.717
1	9 33 11.87	1.9111	9 45 18.8	11.008	1	11 1 58.43	1.8128	0 33 51.3	11.718
2	9 35 6.43	1.9076	9 34 17.4	11.039	2	11 3 47.18	1.8123	0 22 8.2	11.717
3	9 37 0.78	1.9040	9 23 14.1	11.069	3	11 5 35.91	1.8119	+0 10 25.3	11.715
4	9 38 54.91	1.9006	9 12 9.1	11.098	4	11 7 24.61	1.8115	-0 1 17.6	11.713
5	9 40 48.85	1.8973	9 1 2.3	11.127	5	11 9 13.29	1.8113	0 13 0.3	11.711
6	9 42 42.58	1.8938	8 49 53.9	11.155	6	11 11 1.96	1.8111	0 24 42.9	11.708
7	9 44 36.11	1.8907	8 38 43.7	11.183	7	11 12 50.62	1.8109	0 36 25.3	11.704
8	9 46 29.46	1.8875	8 27 31.9	11.209	8	11 14 39.27	1.8108	0 48 7.4	11.699
9	9 48 22.61	1.8843	8 16 18.6	11.234	9	11 16 27.92	1.8108	0 59 49.2	11.695
10	9 50 15.58	1.8813	8 5 3.8	11.259	10	11 18 16.57	1.8108	1 11 30.8	11.690
11	9 52 8.37	1.8783	7 53 47.5	11.284	11	11 20 5.22	1.8108	1 23 12.0	11.683
12	9 54 0.98	1.8754	7 42 29.7	11.308	12	11 21 53.87	1.8110	1 34 52.8	11.677
13	9 55 53.42	1.8726	7 31 10.6	11.330	13	11 23 42.54	1.8113	1 46 33.2	11.669
14	9 57 45.69	1.8698	7 19 50.1	11.353	14	11 25 31.22	1.8116	1 58 13.1	11.661
15	9 59 37.79	1.8670	7 8 28.2	11.374	15	11 27 19.93	1.8119	2 9 52.5	11.653
16	10 1 29.73	1.8644	6 57 5.2	11.394	16	11 29 8.65	1.8123	2 21 31.4	11.644
17	10 3 21.52	1.8618	6 45 40.9	11.415	17	11 30 57.40	1.8128	2 33 9.8	11.634
18	10 5 13.15	1.8592	6 34 15.4	11.435	18	11 32 46.19	1.8133	2 44 47.5	11.623
19	10 7 4.62	1.8568	6 22 48.7	11.453	19	11 34 35.00	1.8138	2 56 24.6	11.613
20	10 8 55.96	1.8543	6 11 21.0	11.471	20	11 36 23.85	1.8146	3 8 1.1	11.602
21	10 10 47.14	1.8519	5 59 52.2	11.488	21	11 38 12.75	1.8153	3 19 36.8	11.589
22	10 12 38.19	1.8498	5 48 22.4	11.505	22	11 40 1.68	1.8160	3 31 11.8	11.577
23	10 14 29.11	1.8475	+5 36 51.6	-11.521	23	11 41 50.67	1.8169	-3 42 46.0	-11.563
MAY 18.					MAY 20.				
	h m s	s	" "	" "		h m s	s	" "	" "
0	10 16 19.89	1.8453	+5 25 19.9	-11.536	0	11 43 39.71	1.8178	-3 54 19.4	-11.549
1	10 18 10.55	1.8433	5 13 47.3	11.552	1	11 45 28.80	1.8188	4 5 51.9	11.535
2	10 20 1.09	1.8413	5 2 13.7	11.566	2	11 47 17.96	1.8198	4 17 23.6	11.520
3	10 21 51.51	1.8393	4 50 39.4	11.578	3	11 49 7.17	1.8208	4 28 54.3	11.504
4	10 23 41.81	1.8374	4 39 4.3	11.592	4	11 50 56.45	1.8219	4 40 24.1	11.488
5	10 25 32.00	1.8356	4 27 28.4	11.604	5	11 52 45.80	1.8232	4 51 52.9	11.471
6	10 27 22.08	1.8338	4 15 51.8	11.616	6	11 54 35.23	1.8244	5 3 20.6	11.453
7	10 29 12.06	1.8322	4 4 14.5	11.627	7	11 56 24.73	1.8257	5 14 47.3	11.435
8	10 31 1.94	1.8306	3 52 36.6	11.637	8	11 58 14.31	1.8271	5 26 12.8	11.416
9	10 32 51.73	1.8290	3 40 58.1	11.646	9	12 0 3.98	1.8286	5 37 37.2	11.397
10	10 34 41.42	1.8274	3 29 19.1	11.655	10	12 1 53.74	1.8300	5 49 0.4	11.377
11	10 36 31.02	1.8260	3 17 39.5	11.663	11	12 3 43.58	1.8315	6 0 22.4	11.356
12	10 38 20.54	1.8247	3 5 59.5	11.671	12	12 5 33.52	1.8332	6 11 43.1	11.334
13	10 40 9.98	1.8234	2 54 19.0	11.678	13	12 7 23.56	1.8348	6 23 2.5	11.313
14	10 41 59.35	1.8222	2 42 38.1	11.685	14	12 9 13.69	1.8364	6 34 20.6	11.289
15	10 43 48.64	1.8209	2 30 56.8	11.691	15	12 11 3.93	1.8383	6 45 37.2	11.266
16	10 45 37.86	1.8198	2 19 15.2	11.696	16	12 12 54.28	1.8401	6 56 52.5	11.243
17	10 47 27.02	1.8188	2 7 33.3	11.701	17	12 14 44.74	1.8420	7 8 6.3	11.218
18	10 49 16.12	1.8178	1 55 51.1	11.706	18	12 16 35.32	1.8439	7 19 18.6	11.193
19	10 51 5.16	1.8169	1 44 8.6	11.709	19	12 18 26.01	1.8459	7 30 29.3	11.166
20	10 52 54.15	1.8161	1 32 26.0	11.712	20	12 20 16.83	1.8480	7 41 38.5	11.140
21	10 54 43.09	1.8153	1 20 43.2	11.714	21	12 22 7.77	1.8500	7 52 46.1	11.112
22	10 56 31.98	1.8145	1 9 0.3	11.716	22	12 23 58.83	1.8522	8 3 51.9	11.083
23	10 58 20.83	1.8139	0 57 17.3	11.717	23	12 25 50.03	1.8545	8 14 56.1	11.055
24	11 0 9.65	1.8133	+0 45 34.3	-11.717	24	12 27 41.37	1.8568	-8 25 58.5	-11.026

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 21.					MAY 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 27 41.37	1.8568	- 8 25 58.5	-11.026	0	14 0 20.97	2.0201	-16 27 28.4	-8.735
1	12 29 32.84	1.8591	8 36 59.2	10.996	1	14 2 22.31	2.0244	16 36 10.5	8.667
2	12 31 24.46	1.8614	8 47 58.0	10.965	2	14 4 23.90	2.0287	16 44 48.4	8.598
3	12 33 16.21	1.8638	8 58 55.0	10.933	3	14 6 25.75	2.0330	16 53 22.2	8.528
4	12 35 8.12	1.8663	9 9 50.0	10.901	4	14 8 27.86	2.0374	17 1 51.8	8.458
5	12 37 0.17	1.8688	9 20 43.1	10.869	5	14 10 30.24	2.0418	17 10 17.2	8.388
6	12 38 52.38	1.8715	9 31 34.3	10.836	6	14 12 32.87	2.0461	17 18 38.3	8.315
7	12 40 44.75	1.8741	9 42 23.4	10.801	7	14 14 35.77	2.0506	17 26 55.0	8.241
8	12 42 37.27	1.8768	9 53 10.4	10.766	8	14 16 38.94	2.0550	17 35 7.2	8.168
9	12 44 29.96	1.8796	10 3 55.3	10.730	9	14 18 42.37	2.0593	17 43 15.1	8.093
10	12 46 22.82	1.8823	10 14 38.0	10.694	10	14 20 46.06	2.0638	17 51 18.4	8.017
11	12 48 15.84	1.8851	10 25 18.6	10.658	11	14 22 50.02	2.0683	17 59 17.1	7.940
12	12 50 9.03	1.8880	10 35 56.9	10.619	12	14 24 54.26	2.0728	18 7 11.2	7.863
13	12 52 2.40	1.8910	10 46 32.9	10.581	13	14 26 58.76	2.0773	18 15 0.6	7.784
14	12 53 55.95	1.8940	10 57 6.6	10.542	14	14 29 3.53	2.0818	18 22 45.3	7.705
15	12 55 49.68	1.8970	11 7 37.9	10.501	15	14 31 8.57	2.0863	18 30 25.2	7.624
16	12 57 43.59	1.9001	11 18 6.7	10.460	16	14 33 13.88	2.0907	18 38 0.2	7.543
17	12 59 37.69	1.9032	11 28 33.1	10.419	17	14 35 19.45	2.0952	18 45 30.4	7.462
18	13 1 31.97	1.9063	11 38 57.0	10.377	18	14 37 25.30	2.0998	18 52 55.6	7.378
19	13 3 26.45	1.9097	11 49 18.3	10.333	19	14 39 31.42	2.1043	19 0 15.7	7.294
20	13 5 21.13	1.9129	11 59 37.0	10.290	20	14 41 37.82	2.1088	19 7 30.9	7.209
21	13 7 16.00	1.9162	12 9 53.1	10.245	21	14 43 44.48	2.1133	19 14 40.8	7.123
22	13 9 11.07	1.9195	12 20 6.4	10.199	22	14 45 51.41	2.1178	19 21 45.7	7.037
23	13 11 6.34	1.9229	-12 30 17.0	-10.153	23	14 47 58.61	2.1223	-19 28 45.2	-6.948
MAY 22.					MAY 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 13 1.82	1.9264	-12 40 24.8	-10.107	0	14 50 6.09	2.1269	-19 35 39.5	-6.861
1	13 14 57.51	1.9298	12 50 29.8	10.059	1	14 52 13.84	2.1313	19 42 28.5	6.772
2	13 16 53.40	1.9333	13 0 31.9	10.010	2	14 54 21.85	2.1358	19 49 12.1	6.681
3	13 18 49.51	1.9370	13 10 31.0	9.961	3	14 56 30.13	2.1403	19 55 50.2	6.589
4	13 20 45.84	1.9406	13 20 27.2	9.911	4	14 58 38.68	2.1448	20 2 22.8	6.498
5	13 22 42.38	1.9442	13 30 20.3	9.860	5	15 0 47.51	2.1493	20 8 49.9	6.405
6	13 24 39.14	1.9479	13 40 10.4	9.808	6	15 2 56.59	2.1537	20 15 11.4	6.312
7	13 26 36.13	1.9517	13 49 57.3	9.756	7	15 5 5.95	2.1582	20 21 27.3	6.217
8	13 28 33.34	1.9553	13 59 41.1	9.703	8	15 7 15.57	2.1626	20 27 37.4	6.120
9	13 30 30.77	1.9592	14 9 21.6	9.648	9	15 9 25.46	2.1670	20 33 41.7	6.024
10	13 32 28.44	1.9631	14 18 58.9	9.593	10	15 11 35.61	2.1713	20 39 40.3	5.928
11	13 34 26.34	1.9669	14 28 32.8	9.537	11	15 13 46.02	2.1758	20 45 33.0	5.829
12	13 36 24.47	1.9708	14 38 3.3	9.480	12	15 15 56.70	2.1802	20 51 19.8	5.730
13	13 38 22.84	1.9748	14 47 30.4	9.423	13	15 18 7.64	2.1844	20 57 0.6	5.630
14	13 40 21.45	1.9788	14 56 54.1	9.365	14	15 20 18.83	2.1888	21 2 35.4	5.529
15	13 42 20.29	1.9828	15 6 14.2	9.306	15	15 22 30.28	2.1930	21 8 4.1	5.427
16	13 44 19.38	1.9868	15 15 30.8	9.246	16	15 24 41.99	2.1973	21 13 26.6	5.324
17	13 46 18.71	1.9909	15 24 43.7	9.185	17	15 26 53.95	2.2015	21 18 43.0	5.222
18	13 48 18.29	1.9950	15 33 53.0	9.123	18	15 29 6.17	2.2057	21 23 53.2	5.118
19	13 50 18.11	1.9991	15 42 58.5	9.061	19	15 31 18.63	2.2098	21 28 57.1	5.013
20	13 52 18.18	2.0033	15 52 0.3	8.998	20	15 33 31.35	2.2140	21 33 54.7	4.907
21	13 54 18.50	2.0074	16 0 58.2	8.933	21	15 35 44.31	2.2181	21 38 45.9	4.800
22	13 56 19.07	2.0117	16 9 52.2	8.868	22	15 37 57.52	2.2222	21 43 30.7	4.693
23	13 58 19.90	2.0158	16 18 42.3	8.802	23	15 40 10.97	2.2261	21 48 9.0	4.584
24	14 0 20.97	2.0201	-16 27 28.4	-8.735	24	15 42 24.65	2.2301	-21 52 40.8	-4.475

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 25.					MAY 27.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 42 24.65	2.2301	-21 52 40.8	-4.475	0	17 33 0.61	2.3523	-23 9 28.8	+1.460
1	15 44 38.58	2.2341	21 57 6.0	4.366	1	17 35 21.77	2.3531	23 7 57.3	1.592
2	15 46 52.74	2.2380	22 1 24.7	4.255	2	17 37 42.98	2.3538	23 6 17.8	1.725
3	15 49 7.14	2.2418	22 5 36.6	4.143	3	17 40 4.22	2.3543	23 4 30.3	1.857
4	15 51 21.76	2.2456	22 9 41.9	4.032	4	17 42 25.50	2.3548	23 2 35.0	1.988
5	15 53 36.61	2.2494	22 13 40.4	3.918	5	17 44 46.80	2.3553	23 0 31.7	2.121
6	15 55 51.69	2.2532	22 17 32.1	3.804	6	17 47 8.13	2.3557	22 58 20.5	2.253
7	15 58 6.99	2.2568	22 21 16.9	3.690	7	17 49 29.48	2.3560	22 56 1.3	2.386
8	16 0 22.51	2.2604	22 24 54.9	3.576	8	17 51 50.85	2.3562	22 53 34.2	2.518
9	16 2 38.24	2.2640	22 28 26.0	3.460	9	17 54 12.22	2.3563	22 50 59.2	2.649
10	16 4 54.19	2.2676	22 31 50.1	3.343	10	17 56 33.60	2.3563	22 48 16.3	2.782
11	16 7 10.35	2.2710	22 35 7.2	3.226	11	17 58 54.98	2.3563	22 45 25.4	2.914
12	16 9 26.71	2.2744	22 38 17.2	3.108	12	18 1 16.36	2.3563	22 42 26.6	3.046
13	16 11 43.28	2.2778	22 41 20.1	2.990	13	18 3 37.73	2.3561	22 39 19.9	3.177
14	16 14 0.04	2.2811	22 44 16.0	2.871	14	18 5 59.09	2.3558	22 36 5.4	3.308
15	16 16 17.01	2.2843	22 47 4.6	2.751	15	18 8 20.43	2.3554	22 32 43.0	3.439
16	16 18 34.16	2.2875	22 49 46.1	2.631	16	18 10 41.74	2.3550	22 29 12.7	3.570
17	16 20 51.51	2.2907	22 52 20.3	2.509	17	18 13 3.03	2.3547	22 25 34.6	3.701
18	16 23 9.04	2.2937	22 54 47.2	2.388	18	18 15 24.30	2.3541	22 21 48.6	3.831
19	16 25 26.75	2.2967	22 57 6.8	2.266	19	18 17 45.52	2.3534	22 17 54.9	3.961
20	16 27 44.64	2.2997	22 59 19.1	2.143	20	18 20 6.71	2.3528	22 13 53.3	4.092
21	16 30 2.71	2.3025	23 1 24.0	2.020	21	18 22 27.86	2.3521	22 9 43.9	4.221
22	16 32 20.94	2.3053	23 3 21.5	1.896	22	18 24 48.96	2.3512	22 5 26.8	4.350
23	16 34 39.34	2.3080	-23 5 11.5	-1.772	23	18 27 10.00	2.3503	-22 1 1.9	+4.479
MAY 26.					MAY 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 36 57.90	2.3107	-23 6 54.1	-1.648	0	18 29 30.99	2.3493	-21 56 29.3	+4.608
1	16 39 16.62	2.3133	23 8 29.2	1.522	1	18 31 51.92	2.3483	21 51 49.0	4.736
2	16 41 35.50	2.3158	23 9 56.7	1.395	2	18 34 12.79	2.3473	21 47 1.0	4.863
3	16 43 54.52	2.3183	23 11 16.6	1.269	3	18 36 33.59	2.3461	21 42 5.4	4.991
4	16 46 13.69	2.3207	23 12 29.0	1.143	4	18 38 54.32	2.3449	21 37 2.1	5.118
5	16 48 33.00	2.3229	23 13 33.7	1.015	5	18 41 14.98	2.3437	21 31 51.3	5.243
6	16 50 52.44	2.3252	23 14 30.8	0.888	6	18 43 35.56	2.3423	21 26 32.9	5.370
7	16 53 12.02	2.3274	23 15 20.3	0.760	7	18 45 56.06	2.3410	21 21 6.9	5.496
8	16 55 31.73	2.3295	23 16 2.0	0.631	8	18 48 16.48	2.3396	21 15 33.4	5.621
9	16 57 51.56	2.3314	23 16 36.0	0.503	9	18 50 36.81	2.3381	21 9 52.4	5.745
10	17 0 11.50	2.3334	23 17 2.3	0.374	10	18 52 57.05	2.3365	21 4 4.0	5.869
11	17 2 31.57	2.3353	23 17 20.9	0.244	11	18 55 17.19	2.3349	20 58 8.1	5.993
12	17 4 51.74	2.3371	23 17 31.6	-0.114	12	18 57 37.24	2.3333	20 52 4.9	6.115
13	17 7 12.02	2.3388	23 17 34.6	+0.016	13	18 59 57.19	2.3317	20 45 54.3	6.238
14	17 9 32.39	2.3404	23 17 29.7	0.146	14	19 2 17.04	2.3299	20 39 36.4	6.360
15	17 11 52.87	2.3420	23 17 17.1	0.276	15	19 4 36.78	2.3281	20 33 11.1	6.482
16	17 14 13.43	2.3434	23 16 56.6	0.408	16	19 6 56.41	2.3263	20 26 38.6	6.601
17	17 16 34.08	2.3448	23 16 28.2	0.538	17	19 9 15.93	2.3243	20 19 59.0	6.721
18	17 18 54.81	2.3461	23 15 52.0	0.669	18	19 11 35.33	2.3225	20 13 12.1	6.841
19	17 21 15.61	2.3473	23 15 7.9	0.801	19	19 13 54.63	2.3206	20 6 18.1	6.959
20	17 23 36.49	2.3485	23 14 15.9	0.933	20	19 16 13.80	2.3185	19 59 17.0	7.078
21	17 25 57.43	2.3496	23 13 16.0	1.064	21	19 18 32.85	2.3165	19 52 8.8	7.194
22	17 28 18.44	2.3506	23 12 8.2	1.196	22	19 20 51.78	2.3145	19 44 53.7	7.311
23	17 30 39.50	2.3514	23 10 52.5	1.328	23	19 23 10.59	2.3123	19 37 31.5	7.428
24	17 33 0.61	2.3523	-23 9 28.8	+1.460	24	19 25 29.26	2.3102	-19 30 2.4	+7.542

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 29.					MAY 31.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 25 20.26	2.3102	-19 30 2.4	+ 7.542	0	21 13 40.51	2.1998	-11 31 48.5	+12.015
1	19 27 47.81	2.3080	19 22 26.5	7.656	1	21 15 52.44	2.1979	11 19 45.6	12.083
2	19 30 6.22	2.3058	19 14 43.7	7.770	2	21 18 4.26	2.1961	11 7 38.6	12.150
3	19 32 24.51	2.3037	19 6 54.1	7.883	3	21 20 15.97	2.1943	10 55 27.6	12.217
4	19 34 42.66	2.3013	18 58 57.7	7.995	4	21 22 27.57	2.1924	10 43 12.6	12.282
5	19 37 0.67	2.2991	18 50 54.7	8.106	5	21 24 39.06	2.1908	10 30 53.8	12.345
6	19 39 18.55	2.2968	18 42 45.0	8.217	6	21 26 50.46	2.1891	10 18 31.2	12.408
7	19 41 36.29	2.2945	18 34 28.7	8.326	7	21 29 1.75	2.1874	10 6 4.9	12.469
8	19 43 53.89	2.2922	18 26 5.9	8.435	8	21 31 12.95	2.1858	9 53 34.9	12.530
9	19 46 11.35	2.2898	18 17 36.5	8.543	9	21 33 24.05	2.1843	9 41 1.3	12.589
10	19 48 28.66	2.2874	18 9 0.7	8.650	10	21 35 35.06	2.1828	9 28 24.2	12.648
11	19 50 45.84	2.2849	18 0 18.5	8.756	11	21 37 45.98	2.1813	9 15 43.6	12.704
12	19 53 2.87	2.2827	17 51 30.0	8.861	12	21 39 56.82	2.1799	9 2 59.7	12.760
13	19 55 19.76	2.2803	17 42 35.2	8.966	13	21 42 7.57	2.1786	8 50 12.4	12.815
14	19 57 36.50	2.2778	17 33 34.1	9.070	14	21 44 18.25	2.1773	8 37 21.9	12.868
15	19 59 53.09	2.2753	17 24 26.8	9.173	15	21 46 28.84	2.1760	8 24 28.2	12.921
16	20 2 9.54	2.2730	17 15 13.3	9.275	16	21 48 39.37	2.1748	8 11 31.4	12.972
17	20 4 25.85	2.2705	17 5 53.8	9.375	17	21 50 49.82	2.1736	7 58 31.6	13.022
18	20 6 42.00	2.2680	16 56 28.3	9.475	18	21 53 0.20	2.1725	7 45 28.8	13.071
19	20 8 58.01	2.2656	16 46 56.8	9.574	19	21 55 10.52	2.1714	7 32 23.1	13.119
20	20 11 13.87	2.2632	16 37 19.4	9.673	20	21 57 20.77	2.1704	7 19 14.5	13.166
21	20 13 29.59	2.2608	16 27 36.1	9.770	21	21 59 30.97	2.1695	7 6 3.2	13.211
22	20 15 45.16	2.2583	16 17 47.0	9.867	22	22 1 41.11	2.1686	6 52 49.2	13.255
23	20 18 0.58	2.2558	-16 7 52.1	+ 9.962	23	22 3 51.20	2.1678	- 6 39 32.6	+13.298
MAY 30.					JUNE 1.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 20 15.85	2.2533	-15 57 51.6	+10.056	0	22 6 1.24	2.1670	- 6 26 13.5	+13.339
1	20 22 30.98	2.2509	15 47 45.4	10.149	1	22 8 11.24	2.1663	6 12 51.9	13.380
2	20 24 45.96	2.2484	15 37 33.7	10.242	2	22 10 21.19	2.1655	5 59 27.9	13.420
3	20 27 0.79	2.2460	15 27 16.4	10.333	3	22 12 31.10	2.1649	5 46 1.5	13.458
4	20 29 15.48	2.2436	15 16 53.7	10.423	4	22 14 40.98	2.1644	5 32 32.9	13.495
5	20 31 30.02	2.2413	15 6 25.6	10.513	5	22 16 50.83	2.1639	5 19 2.1	13.531
6	20 33 44.43	2.2388	14 55 52.2	10.602	6	22 19 0.65	2.1634	5 5 29.2	13.566
7	20 35 58.68	2.2364	14 45 13.4	10.689	7	22 21 10.44	2.1631	4 51 54.2	13.600
8	20 38 12.80	2.2342	14 34 29.5	10.775	8	22 23 20.22	2.1628	4 38 17.2	13.632
9	20 40 26.78	2.2318	14 23 40.4	10.861	9	22 25 29.98	2.1625	4 24 38.4	13.663
10	20 42 40.62	2.2295	14 12 46.2	10.945	10	22 27 39.72	2.1623	4 10 57.7	13.693
11	20 44 54.32	2.2272	14 1 47.0	11.028	11	22 29 49.46	2.1623	3 57 15.2	13.722
12	20 47 7.88	2.2249	13 50 42.8	11.111	12	22 31 59.19	2.1622	3 43 31.1	13.748
13	20 49 21.31	2.2227	13 39 33.7	11.192	13	22 34 8.92	2.1622	3 29 45.4	13.775
14	20 51 34.60	2.2204	13 28 19.8	11.271	14	22 36 18.65	2.1622	3 15 58.1	13.800
15	20 53 47.76	2.2183	13 17 1.2	11.350	15	22 38 28.38	2.1623	3 2 9.4	13.823
16	20 56 0.79	2.2161	13 5 37.8	11.429	16	22 40 38.13	2.1626	2 48 19.3	13.846
17	20 58 13.69	2.2139	12 54 9.7	11.506	17	22 42 47.89	2.1628	2 34 27.9	13.868
18	21 0 26.46	2.2118	12 42 37.1	11.581	18	22 44 57.66	2.1630	2 20 35.2	13.888
19	21 2 39.11	2.2098	12 31 0.0	11.657	19	22 47 7.45	2.1634	2 6 41.4	13.905
20	21 4 51.63	2.2077	12 19 18.3	11.731	20	22 49 17.27	2.1639	1 52 46.6	13.923
21	21 7 4.03	2.2057	12 7 32.3	11.803	21	22 51 27.12	2.1644	1 38 50.7	13.939
22	21 9 16.31	2.2037	11 55 42.0	11.874	22	22 53 37.00	2.1649	1 24 53.9	13.954
23	21 11 28.47	2.2017	11 43 47.4	11.946	23	22 55 46.91	2.1656	1 10 56.2	13.968
24	21 13 40.51	2.1998	-11 31 48.5	+12.015	24	22 57 56.87	2.1663	- 0 56 57.7	+13.980

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 2.					JUNE 4.				
	h m s	s	" "	" "		h m s	s	" "	" "
0	22 57 56.87	2.1663	- 0 56 57.7	+13.980	0	0 43 56.90	2.2735	+10 2 52.3	+12.978
1	23 0 6.87	2.1670	0 42 58.6	13.991	1	0 46 13.42	2.2771	10 15 49.3	12.922
2	23 2 16.91	2.1678	0 28 58.8	14.001	2	0 48 30.15	2.2808	10 28 42.9	12.864
3	23 4 27.01	2.1688	0 14 58.5	14.009	3	0 50 47.11	2.2844	10 41 33.0	12.805
4	23 6 37.16	2.1698	- 0 0 57.7	14.017	4	0 53 4.28	2.2881	10 54 19.5	12.745
5	23 8 47.38	2.1708	+ 0 13 3.5	14.023	5	0 55 21.68	2.2919	11 7 2.4	12.683
6	23 10 57.65	2.1718	0 27 5.0	14.027	6	0 57 39.31	2.2957	11 19 41.5	12.619
7	23 13 7.99	2.1730	0 41 6.7	14.029	7	0 59 57.16	2.2994	11 32 16.7	12.555
8	23 15 18.41	2.1743	0 55 8.5	14.032	8	1 2 15.24	2.3033	11 44 48.1	12.488
9	23 17 28.90	2.1754	1 9 10.5	14.033	9	1 4 33.56	2.3073	11 57 15.3	12.420
10	23 19 39.46	2.1768	1 23 12.4	14.032	10	1 6 52.11	2.3111	12 9 38.5	12.352
11	23 21 50.12	2.1783	1 37 14.3	14.030	11	1 9 10.89	2.3151	12 21 57.5	12.281
12	23 24 0.85	2.1797	1 51 16.0	14.027	12	1 11 29.92	2.3191	12 34 12.2	12.208
13	23 26 11.68	2.1813	2 5 17.5	14.022	13	1 13 49.18	2.3231	12 46 22.5	12.134
14	23 28 22.60	2.1828	2 19 18.6	14.015	14	1 16 8.69	2.3271	12 58 28.3	12.058
15	23 30 33.62	2.1846	2 33 19.3	14.008	15	1 18 28.43	2.3312	13 10 29.5	11.982
16	23 32 44.75	2.1863	2 47 19.6	14.000	16	1 20 48.43	2.3353	13 22 26.1	11.903
17	23 34 55.98	2.1881	3 1 19.3	13.989	17	1 23 8.66	2.3393	13 34 17.9	11.823
18	23 37 7.32	2.1900	3 15 18.3	13.978	18	1 25 29.14	2.3435	13 46 4.9	11.742
19	23 39 18.78	2.1919	3 29 16.6	13.965	19	1 27 49.88	2.3476	13 57 47.0	11.659
20	23 41 30.35	2.1938	3 43 14.1	13.951	20	1 30 10.85	2.3517	14 9 24.0	11.574
21	23 43 42.04	2.1959	3 57 10.7	13.935	21	1 32 32.08	2.3559	14 20 55.9	11.489
22	23 45 53.86	2.1981	4 11 6.3	13.918	22	1 34 53.56	2.3601	14 32 22.7	11.402
23	23 48 5.81	2.2003	+ 4 25 0.9	+13.900	23	1 37 15.29	2.3643	+14 43 44.1	+11.313
JUNE 3.					JUNE 5.				
	h m s	s	" "	" "		h m s	s	" "	" "
0	23 50 17.89	2.2025	+ 4 38 54.3	+13.880	0	1 39 37.27	2.3684	+14 55 0.2	+11.223
1	23 52 30.11	2.2048	4 52 46.5	13.859	1	1 41 59.50	2.3726	15 6 10.8	11.131
2	23 54 42.47	2.2072	5 6 37.4	13.837	2	1 44 21.98	2.3768	15 17 15.9	11.038
3	23 56 54.97	2.2096	5 20 26.9	13.813	3	1 46 44.71	2.3810	15 28 15.3	10.943
4	23 59 7.62	2.2122	5 34 14.9	13.788	4	1 49 7.70	2.3852	15 39 9.0	10.847
5	0 1 20.43	2.2147	5 48 1.4	13.761	5	1 51 30.93	2.3893	15 49 56.9	10.749
6	0 3 33.38	2.2173	6 1 46.2	13.732	6	1 53 54.42	2.3936	16 0 38.9	10.650
7	0 5 46.50	2.2200	6 15 29.2	13.703	7	1 56 18.16	2.3978	16 11 14.9	10.550
8	0 7 59.78	2.2227	6 29 10.5	13.672	8	1 58 42.15	2.4019	16 21 44.9	10.448
9	0 10 13.22	2.2255	6 42 49.8	13.639	9	2 1 6.39	2.4061	16 32 8.6	10.344
10	0 12 26.84	2.2283	6 56 27.2	13.606	10	2 3 30.88	2.4103	16 42 26.2	10.240
11	0 14 40.62	2.2312	7 10 2.5	13.570	11	2 5 55.62	2.4143	16 52 37.4	10.133
12	0 16 54.58	2.2342	7 23 35.6	13.533	12	2 8 20.60	2.4185	17 2 42.2	10.026
13	0 19 8.72	2.2372	7 37 6.5	13.495	13	2 10 45.84	2.4226	17 12 40.5	9.917
14	0 21 23.04	2.2402	7 50 35.0	13.455	14	2 13 11.31	2.4267	17 22 32.2	9.807
15	0 23 37.54	2.2433	8 4 1.1	13.414	15	2 15 37.04	2.4308	17 32 17.3	9.695
16	0 25 52.23	2.2465	8 17 24.7	13.371	16	2 18 3.00	2.4348	17 41 55.6	9.582
17	0 28 7.12	2.2498	8 30 45.6	13.327	17	2 20 29.21	2.4388	17 51 27.1	9.468
18	0 30 22.19	2.2529	8 44 3.9	13.282	18	2 22 55.65	2.4428	18 0 51.7	9.352
19	0 32 37.47	2.2563	8 57 19.4	13.235	19	2 25 22.34	2.4467	18 10 9.3	9.235
20	0 34 52.95	2.2596	9 10 32.1	13.187	20	2 27 49.25	2.4505	18 19 19.9	9.117
21	0 37 8.62	2.2630	9 23 41.8	13.136	21	2 30 16.40	2.4544	18 28 23.3	8.997
22	0 39 24.51	2.2665	9 36 48.4	13.085	22	2 32 43.78	2.4583	18 37 19.5	8.876
23	0 41 40.60	2.2699	9 49 52.0	13.033	23	2 35 11.39	2.4620	18 46 8.4	8.754
24	0 43 56.90	2.2735	+10 2 52.3	+12.978	24	2 37 39.22	2.4658	+18 54 50.0	+ 8.631

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.
JUNE 6.							JUNE 8.						
	h	m	s	s	"	"		h	m	s	s	"	"
0	2	37	39.22	2.4658	+18 54 50.0	+8.631	0	4	38	54.72	2.5496	+23 8 29.5	+1.684
1	2	40	7.28	2.4694	19 3 24.1	8.507	1	4	41	27.67	2.5488	23 10 5.9	1.529
2	2	42	35.55	2.4730	19 11 50.8	8.381	2	4	44	0.57	2.5478	23 11 33.0	1.375
3	2	45	4.04	2.4766	19 20 9.8	8.253	3	4	46	33.40	2.5465	23 12 50.9	1.220
4	2	47	32.74	2.4802	19 28 21.2	8.125	4	4	49	6.15	2.5453	23 13 59.4	1.065
5	2	50	1.66	2.4837	19 36 24.8	7.996	5	4	51	38.83	2.5439	23 14 58.7	0.911
6	2	52	30.78	2.4870	19 44 20.7	7.866	6	4	54	11.42	2.5424	23 15 48.7	0.756
7	2	55	0.10	2.4903	19 52 8.7	7.734	7	4	56	43.92	2.5408	23 16 29.4	0.602
8	2	57	29.62	2.4936	19 59 48.8	7.602	8	4	59	16.31	2.5390	23 17 0.9	0.448
9	2	59	59.33	2.4968	20 7 20.9	7.468	9	5	1	48.60	2.5372	23 17 23.2	0.295
10	3	2	29.24	2.5000	20 14 45.0	7.333	10	5	4	20.77	2.5352	23 17 36.3	+0.143
11	3	4	59.33	2.5030	20 22 0.9	7.198	11	5	6	52.82	2.5331	23 17 40.3	-0.011
12	3	7	29.60	2.5060	20 29 8.7	7.061	12	5	9	24.74	2.5308	23 17 35.0	0.164
13	3	10	0.05	2.5090	20 36 8.2	6.923	13	5	11	56.52	2.5285	23 17 20.6	0.316
14	3	12	30.68	2.5119	20 42 59.4	6.784	14	5	14	28.16	2.5260	23 16 57.1	0.468
15	3	15	1.48	2.5147	20 49 42.3	6.644	15	5	16	59.64	2.5233	23 16 24.5	0.618
16	3	17	32.44	2.5173	20 56 16.7	6.503	16	5	19	30.96	2.5207	23 15 42.9	0.768
17	3	20	3.55	2.5199	21 2 42.7	6.363	17	5	22	2.13	2.5179	23 14 52.3	0.918
18	3	22	34.83	2.5225	21 9 0.2	6.220	18	5	24	33.11	2.5150	23 13 52.7	1.068
19	3	25	6.25	2.5248	21 15 9.1	6.077	19	5	27	3.93	2.5120	23 12 44.2	1.217
20	3	27	37.81	2.5272	21 21 9.4	5.933	20	5	29	34.55	2.5088	23 11 26.7	1.365
21	3	30	9.51	2.5294	21 27 1.0	5.788	21	5	32	4.99	2.5057	23 10 0.4	1.512
22	3	32	41.34	2.5316	21 32 43.9	5.643	22	5	34	35.23	2.5023	23 8 25.3	1.659
23	3	35	13.30	2.5337	+21 38 18.1	+5.496	23	5	37	5.27	2.4988	+23 6 41.3	-1.806
JUNE 7.							JUNE 9.						
0	3	37	45.38	2.5357	+21 43 43.4	+5.348	0	5	39	35.09	2.4953	+23 4 48.6	-1.951
1	3	40	17.58	2.5375	21 48 59.9	5.201	1	5	42	4.70	2.4917	23 2 47.2	2.096
2	3	42	49.88	2.5392	21 54 7.5	5.053	2	5	44	34.09	2.4879	23 0 37.1	2.239
3	3	45	22.28	2.5409	21 59 6.2	4.904	3	5	47	3.25	2.4840	22 58 18.5	2.383
4	3	47	54.79	2.5425	22 3 56.0	4.754	4	5	49	32.17	2.4801	22 55 51.2	2.526
5	3	50	27.38	2.5438	22 8 36.7	4.604	5	5	52	0.86	2.4761	22 53 15.4	2.667
6	3	53	0.05	2.5452	22 13 8.5	4.453	6	5	54	29.30	2.4719	22 50 31.2	2.808
7	3	55	32.80	2.5464	22 17 31.1	4.302	7	5	56	57.49	2.4677	22 47 38.5	2.948
8	3	58	5.62	2.5476	22 21 44.7	4.151	8	5	59	25.42	2.4633	22 44 37.5	3.086
9	4	0	38.51	2.5486	22 25 49.2	3.998	9	6	1	53.09	2.4589	22 41 28.2	3.224
10	4	3	11.45	2.5494	22 29 44.5	3.846	10	6	4	20.49	2.4544	22 38 10.6	3.362
11	4	5	44.44	2.5503	22 33 30.7	3.693	11	6	6	47.62	2.4498	22 34 44.8	3.498
12	4	8	17.48	2.5509	22 37 7.7	3.540	12	6	9	14.47	2.4452	22 31 10.9	3.633
13	4	10	50.55	2.5515	22 40 35.5	3.386	13	6	11	41.04	2.4405	22 27 28.9	3.767
14	4	13	23.66	2.5519	22 43 54.0	3.232	14	6	14	7.33	2.4357	22 23 38.9	3.900
15	4	15	56.78	2.5522	22 47 3.3	3.078	15	6	16	33.32	2.4308	22 19 40.9	4.033
16	4	18	29.92	2.5524	22 50 3.4	2.924	16	6	18	59.02	2.4258	22 15 35.0	4.163
17	4	21	3.07	2.5525	22 52 54.2	2.769	17	6	21	24.42	2.4208	22 11 21.3	4.293
18	4	23	36.22	2.5524	22 55 35.7	2.614	18	6	23	49.52	2.4158	22 6 59.8	4.423
19	4	26	9.36	2.5523	22 58 7.9	2.459	19	6	26	14.31	2.4105	22 2 30.6	4.551
20	4	28	42.49	2.5519	23 0 30.8	2.305	20	6	28	38.78	2.4053	21 57 53.7	4.678
21	4	31	15.59	2.5515	23 2 44.5	2.150	21	6	31	2.95	2.4001	21 53 9.3	4.803
22	4	33	48.67	2.5511	23 4 48.8	1.994	22	6	33	26.79	2.3947	21 48 17.3	4.928
23	4	36	21.72	2.5504	23 6 43.8	1.839	23	6	35	50.31	2.3893	21 43 17.9	5.052
24	4	38	54.72	2.5496	+23 8 29.5	+1.684	24	6	38	13.50	2.3838	+21 38 11.1	-5.174

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 10.					JUNE 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 38 13.50	2.3838	+21 38 11.1	-5.174	0	8 25 51.97	2.1006	+15 31 52.6	-9.619
1	6 40 36.37	2.3783	21 32 57.0	5.295	1	8 27 57.84	2.0950	15 22 13.5	9.683
2	6 42 58.90	2.3728	21 27 35.7	5.414	2	8 30 3.37	2.0894	15 12 30.7	9.745
3	6 45 21.10	2.3672	21 22 7.3	5.533	3	8 32 8.57	2.0839	15 2 44.1	9.806
4	6 47 42.96	2.3615	21 16 31.7	5.651	4	8 34 13.44	2.0784	14 52 54.0	9.866
5	6 50 4.48	2.3558	21 10 49.2	5.768	5	8 36 17.98	2.0730	14 43 0.2	9.925
6	6 52 25.66	2.3501	21 4 59.6	5.883	6	8 38 22.20	2.0677	14 33 3.0	9.982
7	6 54 46.49	2.3443	20 59 3.2	5.998	7	8 40 26.10	2.0623	14 23 2.4	10.038
8	6 57 6.98	2.3386	20 52 59.9	6.110	8	8 42 29.67	2.0569	14 12 58.4	10.095
9	6 59 27.12	2.3328	20 46 50.0	6.222	9	8 44 32.93	2.0518	14 2 51.0	10.149
10	7 1 46.91	2.3268	20 40 33.3	6.333	10	8 46 35.88	2.0465	13 52 40.5	10.203
11	7 4 6.34	2.3209	20 34 10.0	6.443	11	8 48 38.51	2.0413	13 42 26.7	10.255
12	7 6 25.42	2.3150	20 27 40.2	6.550	12	8 50 40.84	2.0363	13 32 9.9	10.306
13	7 8 44.14	2.3091	20 21 4.0	6.657	13	8 52 42.86	2.0312	13 21 50.0	10.356
14	7 11 2.51	2.3031	20 14 21.4	6.763	14	8 54 44.58	2.0261	13 11 27.2	10.405
15	7 13 20.51	2.2971	20 7 32.5	6.867	15	8 56 45.99	2.0211	13 1 1.4	10.454
16	7 15 38.16	2.2911	20 0 37.4	6.969	16	8 58 47.11	2.0163	12 50 32.7	10.502
17	7 17 55.44	2.2851	19 53 36.2	7.071	17	9 0 47.94	2.0114	12 40 1.2	10.548
18	7 20 12.37	2.2791	19 46 28.9	7.173	18	9 2 48.48	2.0065	12 29 27.0	10.593
19	7 22 28.93	2.2729	19 39 15.5	7.272	19	9 4 48.72	2.0018	12 18 50.1	10.638
20	7 24 45.12	2.2669	19 31 56.3	7.369	20	9 6 48.69	1.9971	12 8 10.5	10.681
21	7 27 0.96	2.2608	19 24 31.2	7.467	21	9 8 48.37	1.9923	11 57 28.4	10.723
22	7 29 16.42	2.2548	19 17 0.3	7.563	22	9 10 47.77	1.9878	11 46 43.8	10.764
23	7 31 31.53	2.2488	+19 9 23.7	-7.657	23	9 12 46.90	1.9832	+11 35 56.7	-10.805
JUNE 11.					JUNE 13.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 33 46.27	2.2426	+19 1 41.5	-7.750	0	9 14 45.75	1.9787	+11 25 7.2	-10.844
1	7 36 0.64	2.2365	18 53 53.7	7.842	1	9 16 44.34	1.9743	11 14 15.4	10.883
2	7 38 14.65	2.2305	18 46 0.5	7.932	2	9 18 42.66	1.9699	11 3 21.2	10.921
3	7 40 28.30	2.2244	18 38 1.9	8.022	3	9 20 40.73	1.9656	10 52 24.9	10.958
4	7 42 41.58	2.2183	18 29 57.9	8.110	4	9 22 38.53	1.9613	10 41 26.3	10.994
5	7 44 54.49	2.2123	18 21 48.7	8.197	5	9 24 36.09	1.9572	10 30 25.6	11.028
6	7 47 7.05	2.2063	18 13 34.3	8.283	6	9 26 33.39	1.9529	10 19 22.9	11.063
7	7 49 19.24	2.2001	18 5 14.8	8.367	7	9 28 30.44	1.9489	10 8 18.1	11.096
8	7 51 31.06	2.1941	17 56 50.3	8.450	8	9 30 27.26	1.9449	9 57 11.4	11.128
9	7 53 42.53	2.1882	17 48 20.8	8.533	9	9 32 23.83	1.9408	9 46 2.7	11.160
10	7 55 53.64	2.1822	17 39 46.4	8.613	10	9 34 20.16	1.9369	9 34 52.2	11.190
11	7 58 4.39	2.1761	17 31 7.3	8.693	11	9 36 16.26	1.9332	9 23 39.9	11.219
12	8 0 14.77	2.1701	17 22 23.3	8.772	12	9 38 12.14	1.9294	9 12 25.9	11.248
13	8 2 24.80	2.1642	17 13 34.7	8.848	13	9 40 7.79	1.9256	9 1 10.1	11.277
14	8 4 34.47	2.1583	17 4 41.5	8.924	14	9 42 3.21	1.9219	8 49 52.7	11.303
15	8 6 43.79	2.1524	16 55 43.8	8.998	15	9 43 58.42	1.9183	8 38 33.7	11.330
16	8 8 52.76	2.1465	16 46 41.7	9.073	16	9 45 53.41	1.9148	8 27 13.1	11.357
17	8 11 1.37	2.1406	16 37 35.1	9.146	17	9 47 48.19	1.9113	8 15 50.9	11.382
18	8 13 9.63	2.1348	16 28 24.2	9.216	18	9 49 42.76	1.9078	8 4 27.3	11.404
19	8 15 17.55	2.1291	16 19 9.2	9.286	19	9 51 37.13	1.9045	7 53 2.4	11.428
20	8 17 25.12	2.1233	16 9 49.9	9.356	20	9 53 31.30	1.9013	7 41 36.0	11.451
21	8 19 32.34	2.1176	16 0 26.5	9.423	21	9 55 25.28	1.8980	7 30 8.3	11.473
22	8 21 39.23	2.1119	15 50 59.1	9.489	22	9 57 19.06	1.8948	7 18 39.3	11.493
23	8 23 45.77	2.1062	15 41 27.8	9.554	23	9 59 12.66	1.8918	7 7 9.1	11.513
24	8 25 51.97	2.1006	+15 31 52.6	-9.619	24	10 1 6.07	1.8887	+ 6 55 37.7	-11.533

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 14.					JUNE 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 1 6.07	1.8887	+6 55 37.7	-11.533	0	11 29 29.32	1.8192	- 2 27 7.3	-11.669
1	10 2 59.30	1.8858	6 44 5.2	11.551	1	11 31 18.48	1.8193	2 38 47.1	11.658
2	10 4 52.36	1.8828	6 32 31.6	11.568	2	11 33 7.64	1.8195	2 50 26.2	11.645
3	10 6 45.24	1.8799	6 20 57.0	11.586	3	11 34 56.82	1.8198	3 2 4.5	11.632
4	10 8 37.95	1.8772	6 9 21.3	11.603	4	11 36 46.02	1.8202	3 13 42.0	11.618
5	10 10 30.50	1.8744	5 57 44.7	11.618	5	11 38 35.24	1.8206	3 25 18.6	11.603
6	10 12 22.88	1.8718	5 46 7.2	11.633	6	11 40 24.49	1.8210	3 36 54.4	11.588
7	10 14 15.11	1.8693	5 34 28.7	11.648	7	11 42 13.76	1.8215	3 48 29.2	11.572
8	10 16 7.19	1.8667	5 22 49.5	11.661	8	11 44 3.07	1.8220	4 0 3.0	11.556
9	10 17 59.11	1.8642	5 11 9.4	11.674	9	11 45 52.41	1.8228	4 11 35.9	11.539
10	10 19 50.89	1.8618	4 59 28.6	11.686	10	11 47 41.80	1.8236	4 23 7.7	11.521
11	10 21 42.53	1.8595	4 47 47.1	11.697	11	11 49 31.24	1.8243	4 34 38.4	11.503
12	10 23 34.03	1.8573	4 36 5.0	11.708	12	11 51 20.71	1.8250	4 46 8.1	11.485
13	10 25 25.40	1.8550	4 24 22.2	11.718	13	11 53 10.24	1.8260	4 57 36.6	11.465
14	10 27 16.63	1.8528	4 12 38.9	11.728	14	11 54 59.83	1.8270	5 9 3.9	11.445
15	10 29 7.74	1.8508	4 0 54.9	11.737	15	11 56 49.48	1.8280	5 20 30.0	11.425
16	10 30 58.73	1.8488	3 49 10.5	11.744	16	11 58 39.19	1.8291	5 31 54.9	11.404
17	10 32 49.60	1.8468	3 37 25.6	11.752	17	12 0 28.97	1.8302	5 43 18.5	11.382
18	10 34 40.35	1.8450	3 25 40.3	11.758	18	12 2 18.81	1.8314	5 54 40.7	11.360
19	10 36 31.00	1.8432	3 13 54.6	11.764	19	12 4 8.74	1.8328	6 6 1.7	11.338
20	10 38 21.53	1.8414	3 2 8.6	11.769	20	12 5 58.74	1.8340	6 17 21.2	11.313
21	10 40 11.97	1.8398	2 50 22.3	11.775	21	12 7 48.82	1.8354	6 28 39.3	11.289
22	10 42 2.31	1.8382	2 38 35.6	11.779	22	12 9 38.99	1.8369	6 39 55.9	11.264
23	10 43 52.55	1.8366	+2 26 48.8	-11.782	23	12 11 29.25	1.8383	- 6 51 11.0	-11.239
JUNE 15.					JUNE 17.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 45 42.70	1.8352	+2 15 1.8	-11.785	0	12 13 19.59	1.8399	- 7 2 24.6	-11.213
1	10 47 32.77	1.8338	2 3 14.6	11.788	1	12 15 10.04	1.8416	7 13 36.6	11.187
2	10 49 22.75	1.8323	1 51 27.3	11.788	2	12 17 0.58	1.8433	7 24 47.0	11.160
3	10 51 12.65	1.8311	1 39 40.0	11.789	3	12 18 51.23	1.8451	7 35 55.8	11.133
4	10 53 2.48	1.8299	1 27 52.6	11.790	4	12 20 41.99	1.8469	7 47 2.9	11.104
5	10 54 52.24	1.8288	1 16 5.2	11.790	5	12 22 32.86	1.8488	7 58 8.3	11.075
6	10 56 41.93	1.8277	1 4 17.8	11.789	6	12 24 23.84	1.8507	8 9 11.9	11.045
7	10 58 31.56	1.8266	0 52 30.5	11.788	7	12 26 14.94	1.8527	8 20 13.7	11.015
8	11 0 21.12	1.8257	0 40 43.3	11.786	8	12 28 6.16	1.8548	8 31 13.7	10.984
9	11 2 10.64	1.8248	0 28 56.2	11.783	9	12 29 57.51	1.8568	8 42 11.8	10.953
10	11 4 0.10	1.8239	0 17 9.4	11.779	10	12 31 48.98	1.8590	8 53 8.0	10.921
11	11 5 49.51	1.8232	+0 5 22.7	11.775	11	12 33 40.59	1.8613	9 4 2.3	10.888
12	11 7 38.88	1.8225	-0 6 23.6	11.770	12	12 35 32.33	1.8635	9 14 54.5	10.853
13	11 9 28.21	1.8219	0 18 9.7	11.766	13	12 37 24.21	1.8658	9 25 44.7	10.820
14	11 11 17.51	1.8213	0 29 55.5	11.760	14	12 39 16.23	1.8683	9 36 32.9	10.786
15	11 13 6.77	1.8208	0 41 40.9	11.753	15	12 41 8.40	1.8707	9 47 19.0	10.750
16	11 14 56.00	1.8203	0 53 25.9	11.746	16	12 43 0.71	1.8732	9 58 2.9	10.714
17	11 16 45.21	1.8200	1 5 10.4	11.738	17	12 44 53.18	1.8758	10 8 44.7	10.678
18	11 18 34.40	1.8198	1 16 54.5	11.731	18	12 46 45.80	1.8784	10 19 24.2	10.640
19	11 20 23.58	1.8195	1 28 38.1	11.723	19	12 48 38.59	1.8811	10 30 1.5	10.602
20	11 22 12.74	1.8193	1 40 21.2	11.713	20	12 50 31.53	1.8838	10 40 36.4	10.563
21	11 24 1.89	1.8191	1 52 3.7	11.703	21	12 52 24.64	1.8866	10 51 9.0	10.524
22	11 25 51.03	1.8191	2 3 45.6	11.693	22	12 54 17.92	1.8894	11 1 39.3	10.484
23	11 27 40.18	1.8191	2 15 26.8	11.681	23	12 56 11.37	1.8923	11 12 7.1	10.443
24	11 29 29.32	1.8192	-2 27 7.3	-11.669	24	12 58 4.99	1.8952	-11 22 32.4	-10.40

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.
JUNE 18.					JUNE 20.			
	h m s	s	° ' "	"		h m s	s	° ' "
0	12 58 4.99	1.8962	-11 22 32.4	-10.401	0	14 33 18.74	2.0869	-18 39 45.5
1	12 59 58.79	1.8983	11 32 55.2	10.359	1	14 35 24.10	2.0917	18 47 13.4
2	13 1 52.78	1.9013	11 43 15.5	10.317	2	14 37 29.74	2.0963	18 54 36.5
3	13 3 46.95	1.9043	11 53 33.2	10.273	3	14 39 35.66	2.1011	19 1 54.6
4	13 5 41.30	1.9075	12 3 48.2	10.228	4	14 41 41.87	2.1059	19 9 7.7
5	13 7 35.85	1.9107	12 14 0.6	10.184	5	14 43 48.37	2.1107	19 16 15.8
6	13 9 30.58	1.9139	12 24 10.3	10.138	6	14 45 55.15	2.1154	19 23 18.8
7	13 11 25.52	1.9173	12 34 17.1	10.091	7	14 48 2.22	2.1202	19 30 16.6
8	13 13 20.65	1.9206	12 44 21.2	10.044	8	14 50 9.57	2.1249	19 37 9.2
9	13 15 15.99	1.9240	12 54 22.4	9.996	9	14 52 17.21	2.1298	19 43 56.6
10	13 17 11.53	1.9274	13 4 20.7	9.948	10	14 54 25.14	2.1346	19 50 38.6
11	13 19 7.28	1.9308	13 14 16.1	9.898	11	14 56 33.36	2.1394	19 57 15.2
12	13 21 3.23	1.9343	13 24 8.5	9.848	12	14 58 41.87	2.1442	20 3 46.4
13	13 22 59.40	1.9380	13 33 57.9	9.797	13	15 0 50.66	2.1489	20 10 12.2
14	13 24 55.79	1.9417	13 43 44.1	9.745	14	15 2 59.74	2.1537	20 16 32.4
15	13 26 52.40	1.9453	13 53 27.3	9.693	15	15 5 9.10	2.1585	20 22 47.0
16	13 28 49.23	1.9491	14 3 7.3	9.640	16	15 7 18.76	2.1633	20 28 55.9
17	13 30 46.29	1.9528	14 12 44.1	9.586	17	15 9 28.69	2.1679	20 34 59.2
18	13 32 43.57	1.9566	14 22 17.6	9.531	18	15 11 38.91	2.1728	20 40 56.7
19	13 34 41.08	1.9605	14 31 47.8	9.476	19	15 13 49.42	2.1775	20 46 48.5
20	13 36 38.83	1.9644	14 41 14.7	9.419	20	15 16 0.21	2.1822	20 52 34.3
21	13 38 36.81	1.9683	14 50 38.1	9.363	21	15 18 11.28	2.1868	20 58 14.2
22	13 40 35.02	1.9723	14 59 58.2	9.305	22	15 20 22.63	2.1915	21 3 48.2
23	13 42 33.48	1.9763	-15 9 14.7	-9.245	23	15 22 34.26	2.1962	-21 9 16.1
JUNE 19.					JUNE 21.			
	h m s	s	° ' "	"		h m s	s	° ' "
0	13 44 32.18	1.9803	-15 18 27.6	-9.186	0	15 24 46.17	2.2008	-21 14 37.9
1	13 46 31.12	1.9844	15 27 37.0	9.126	1	15 26 58.36	2.2055	21 19 53.6
2	13 48 30.31	1.9886	15 36 42.7	9.065	2	15 29 10.83	2.2102	21 25 3.1
3	13 50 29.75	1.9928	15 45 44.8	9.003	3	15 31 23.58	2.2148	21 30 6.4
4	13 52 29.44	1.9969	15 54 43.1	8.940	4	15 33 36.60	2.2193	21 35 3.4
5	13 54 29.38	2.0012	16 3 37.6	8.877	5	15 35 49.89	2.2238	21 39 54.1
6	13 56 29.58	2.0055	16 12 28.3	8.812	6	15 38 3.45	2.2283	21 44 38.3
7	13 58 30.04	2.0098	16 21 15.0	8.747	7	15 40 17.29	2.2328	21 49 16.2
8	14 0 30.75	2.0140	16 29 57.9	8.681	8	15 42 31.39	2.2372	21 53 47.5
9	14 2 31.72	2.0184	16 38 36.7	8.613	9	15 44 45.75	2.2416	21 58 12.3
10	14 4 32.96	2.0228	16 47 11.5	8.546	10	15 47 0.38	2.2460	22 2 30.5
11	14 6 34.46	2.0272	16 55 42.2	8.478	11	15 49 15.27	2.2504	22 6 42.0
12	14 8 36.22	2.0317	17 4 8.8	8.408	12	15 51 30.43	2.2548	22 10 46.9
13	14 10 38.26	2.0362	17 12 31.2	8.338	13	15 53 45.84	2.2592	22 14 45.0
14	14 12 40.56	2.0407	17 20 49.3	8.266	14	15 56 1.50	2.2637	22 18 36.3
15	14 14 43.14	2.0453	17 29 3.1	8.194	15	15 58 17.42	2.2673	22 22 20.7
16	14 16 45.99	2.0498	17 37 12.6	8.122	16	16 0 33.58	2.2714	22 25 58.2
17	14 18 49.11	2.0543	17 45 17.7	8.048	17	16 2 49.93	2.2756	22 29 28.9
18	14 20 52.51	2.0589	17 53 18.3	7.973	18	16 5 6.65	2.2796	22 32 52.5
19	14 22 56.18	2.0636	18 1 14.4	7.897	19	16 7 23.54	2.2835	22 36 9.1
20	14 25 0.14	2.0683	18 9 5.9	7.821	20	16 9 40.67	2.2875	22 39 18.6
21	14 27 4.37	2.0728	18 16 52.9	7.743	21	16 11 58.04	2.2914	22 42 21.0
22	14 29 8.88	2.0775	18 24 35.1	7.665	22	16 14 15.64	2.2952	22 45 16.2
23	14 31 13.67	2.0822	18 32 12.7	7.587	23	16 16 33.46	2.2990	22 48 4.2
24	14 33 18.74	2.0869	-18 39 45.5	-7.506	24	16 18 51.52	2.3028	-22 50 45.0

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 22.					JUNE 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 18 51.52	2.3028	-22 50 45.0	-2.619	0	18 12 19.05	2.3938	-22 26 54.6	+3.726
1	16 21 9.79	2.3063	22 53 18.5	2.497	1	18 14 42.67	2.3937	22 23 7.0	3.862
2	16 23 28.28	2.3100	22 55 44.6	2.374	2	18 17 6.29	2.3934	22 19 11.2	3.997
3	16 25 46.99	2.3136	22 58 3.4	2.251	3	18 19 29.88	2.3931	22 15 7.4	4.132
4	16 28 5.91	2.3170	23 0 14.7	2.127	4	18 21 53.46	2.3928	22 10 55.4	4.267
5	16 30 25.03	2.3203	23 2 18.6	2.003	5	18 24 17.01	2.3923	22 6 35.4	4.401
6	16 32 44.35	2.3238	23 4 15.0	1.877	6	18 26 40.53	2.3918	22 2 7.3	4.534
7	16 35 3.88	2.3270	23 6 3.8	1.751	7	18 29 4.02	2.3912	21 57 31.3	4.668
8	16 37 23.59	2.3302	23 7 45.1	1.625	8	18 31 27.47	2.3904	21 52 47.2	4.802
9	16 39 43.50	2.3334	23 9 18.8	1.498	9	18 33 50.87	2.3897	21 47 55.1	4.935
10	16 42 3.60	2.3365	23 10 44.8	1.369	10	18 36 14.23	2.3888	21 42 55.0	5.068
11	16 44 23.88	2.3394	23 12 3.1	1.242	11	18 38 37.53	2.3878	21 37 47.0	5.199
12	16 46 44.33	2.3423	23 13 13.8	1.113	12	18 41 0.77	2.3868	21 32 31.1	5.331
13	16 49 4.96	2.3453	23 14 16.7	0.984	13	18 43 23.95	2.3858	21 27 7.3	5.463
14	16 51 25.76	2.3480	23 15 11.9	0.854	14	18 45 47.07	2.3847	21 21 35.6	5.593
15	16 53 46.72	2.3508	23 15 59.2	0.723	15	18 48 10.11	2.3835	21 15 56.1	5.723
16	16 56 7.85	2.3534	23 16 38.7	0.593	16	18 50 33.09	2.3823	21 10 8.8	5.853
17	16 58 29.13	2.3559	23 17 10.4	0.462	17	18 52 55.98	2.3808	21 4 13.7	5.983
18	17 0 50.56	2.3583	23 17 34.1	0.330	18	18 55 18.79	2.3795	20 58 10.9	6.111
19	17 3 12.13	2.3608	23 17 50.0	0.198	19	18 57 41.52	2.3781	20 52 0.4	6.239
20	17 5 33.85	2.3631	23 17 57.9	-0.066	20	19 0 4.16	2.3765	20 45 42.2	6.367
21	17 7 55.70	2.3653	23 17 57.9	+0.067	21	19 2 26.70	2.3748	20 39 16.4	6.493
22	17 10 17.69	2.3676	23 17 49.9	0.201	22	19 4 49.14	2.3733	20 32 43.0	6.620
23	17 12 39.81	2.3696	-23 17 33.8	+0.334	23	19 7 11.49	2.3715	-20 26 2.0	+6.745
JUNE 23.					JUNE 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 15 2.04	2.3715	-23 17 9.8	+0.468	0	19 9 33.72	2.3697	-20 19 13.6	+6.870
1	17 17 24.39	2.3735	23 16 37.7	0.602	1	19 11 55.85	2.3679	20 12 17.6	6.994
2	17 19 46.86	2.3753	23 15 57.6	0.736	2	19 14 17.87	2.3661	20 5 14.3	7.118
3	17 22 9.43	2.3771	23 15 9.4	0.871	3	19 16 39.78	2.3642	19 58 3.5	7.241
4	17 24 32.11	2.3788	23 14 13.1	1.006	4	19 19 1.57	2.3622	19 50 45.4	7.363
5	17 26 54.88	2.3803	23 13 8.7	1.141	5	19 21 23.24	2.3601	19 43 19.9	7.484
6	17 29 17.74	2.3818	23 11 56.2	1.276	6	19 23 44.78	2.3580	19 35 47.3	7.604
7	17 31 40.69	2.3832	23 10 35.6	1.412	7	19 26 6.20	2.3560	19 28 7.4	7.724
8	17 34 3.72	2.3844	23 9 6.8	1.548	8	19 28 27.50	2.3538	19 20 20.4	7.843
9	17 36 26.82	2.3857	23 7 29.8	1.684	9	19 30 48.66	2.3516	19 12 26.2	7.962
10	17 38 50.00	2.3869	23 5 44.7	1.820	10	19 33 9.69	2.3493	19 4 25.0	8.078
11	17 41 13.25	2.3879	23 3 51.4	1.957	11	19 35 30.58	2.3470	18 56 16.8	8.194
12	17 43 36.55	2.3888	23 1 49.9	2.093	12	19 37 51.33	2.3447	18 48 1.7	8.310
13	17 45 59.91	2.3898	22 59 40.3	2.228	13	19 40 11.94	2.3423	18 39 39.6	8.425
14	17 48 23.32	2.3906	22 57 22.5	2.365	14	19 42 32.41	2.3400	18 31 10.7	8.538
15	17 50 46.78	2.3913	22 54 56.5	2.502	15	19 44 52.74	2.3376	18 22 35.0	8.651
16	17 53 10.27	2.3918	22 52 22.3	2.638	16	19 47 12.92	2.3351	18 13 52.6	8.763
17	17 55 33.80	2.3924	22 49 39.9	2.774	17	19 49 32.95	2.3326	18 5 3.4	8.874
18	17 57 57.36	2.3929	22 46 49.4	2.910	18	19 51 52.83	2.3301	17 56 7.7	8.983
19	18 0 20.95	2.3933	22 43 50.7	3.047	19	19 54 12.56	2.3275	17 47 5.4	9.093
20	18 2 44.55	2.3935	22 40 43.8	3.183	20	19 56 32.13	2.3250	17 37 56.5	9.202
21	18 5 8.17	2.3937	22 37 28.7	3.319	21	19 58 51.56	2.3224	17 28 41.2	9.308
22	18 7 31.79	2.3938	22 34 5.5	3.455	22	20 1 10.82	2.3198	17 19 19.5	9.414
23	18 9 55.42	2.3938	22 30 34.1	3.591	23	20 3 29.93	2.3171	17 9 51.5	9.519
24	18 12 19.05	2.3938	-22 26 54.6	+3.726	24	20 5 48.87	2.3144	-17 0 17.2	+9.623

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.				
JUNE 26.							JUNE 28.									
	h	m	s	s	°	'	''		h	m	s	s	°	'	''	
0	20	5	48.87	2.3144	-17	0	17.2	+ 9.623	0	21	53	54.82	2.1973	-7	40	24.3
1	20	8	7.66	2.3118	16	50	36.7	9.726	1	21	56	6.61	2.1957	7	27	8.8
2	20	10	26.29	2.3092	16	40	50.1	9.828	2	21	58	18.31	2.1941	7	13	50.7
3	20	12	44.76	2.3065	16	30	57.4	9.928	3	22	0	29.90	2.1924	7	0	30.0
4	20	15	3.07	2.3038	16	20	58.7	10.028	4	22	2	41.40	2.1910	6	47	6.9
5	20	17	21.21	2.3011	16	10	54.1	10.127	5	22	4	52.82	2.1895	6	33	41.3
6	20	19	39.20	2.2984	16	0	43.5	10.224	6	22	7	4.14	2.1879	6	20	13.5
7	20	21	57.02	2.2957	15	50	27.2	10.321	7	22	9	15.37	2.1866	6	6	43.4
8	20	24	14.68	2.2929	15	40	5.0	10.417	8	22	11	26.53	2.1853	5	53	11.1
9	20	26	32.17	2.2902	15	29	37.2	10.510	9	22	13	37.61	2.1840	5	39	36.8
10	20	28	49.50	2.2875	15	19	3.8	10.603	10	22	15	48.61	2.1828	5	26	0.4
11	20	31	6.67	2.2848	15	8	24.8	10.695	11	22	17	59.54	2.1815	5	12	22.2
12	20	33	23.67	2.2820	14	57	40.4	10.785	12	22	20	10.39	2.1804	4	58	42.0
13	20	35	40.51	2.2793	14	46	50.6	10.875	13	22	22	21.19	2.1794	4	45	0.1
14	20	37	57.19	2.2766	14	35	55.4	10.964	14	22	24	31.92	2.1783	4	31	16.6
15	20	40	13.70	2.2738	14	24	54.9	11.051	15	22	26	42.59	2.1774	4	17	31.4
16	20	42	30.05	2.2712	14	13	49.3	11.137	16	22	28	53.21	2.1765	4	3	44.7
17	20	44	46.24	2.2685	14	2	38.5	11.222	17	22	31	3.77	2.1757	3	49	56.5
18	20	47	2.27	2.2658	13	51	22.7	11.305	18	22	33	14.29	2.1749	3	36	7.0
19	20	49	18.14	2.2632	13	40	1.9	11.388	19	22	35	24.76	2.1742	3	22	16.1
20	20	51	33.85	2.2605	13	28	36.2	11.469	20	22	37	35.19	2.1735	3	8	24.1
21	20	53	49.40	2.2578	13	17	5.6	11.549	21	22	39	45.58	2.1729	2	54	30.9
22	20	56	4.79	2.2552	13	5	30.3	11.628	22	22	41	55.94	2.1724	2	40	36.6
23	20	58	20.02	2.2526	-12	53	50.2	+11.706	23	22	44	6.27	2.1718	-2	26	41.4
JUNE 27.							JUNE 29.									
0	21	0	35.10	2.2501	-12	42	5.6	+11.782	0	22	46	16.56	2.1714	-2	12	45.3
1	21	2	50.03	2.2475	12	30	16.4	11.857	1	22	48	26.84	2.1711	1	58	48.4
2	21	5	4.80	2.2449	12	18	22.8	11.931	2	22	50	37.09	2.1707	1	44	50.7
3	21	7	19.42	2.2425	12	6	24.7	12.003	3	22	52	47.32	2.1705	1	30	52.3
4	21	9	33.90	2.2400	11	54	22.4	12.074	4	22	54	57.55	2.1704	1	16	53.4
5	21	11	48.22	2.2375	11	42	15.8	12.145	5	22	57	7.77	2.1703	1	2	54.0
6	21	14	2.40	2.2351	11	30	5.0	12.214	6	22	59	17.98	2.1702	0	48	54.1
7	21	16	16.43	2.2328	11	17	50.1	12.282	7	23	1	28.19	2.1702	0	34	53.9
8	21	18	30.33	2.2304	11	5	31.2	12.348	8	23	3	38.40	2.1703	0	20	53.4
9	21	20	44.08	2.2280	10	53	8.3	12.413	9	23	5	48.62	2.1703	-0	6	52.8
10	21	22	57.69	2.2257	10	40	41.6	12.477	10	23	7	58.84	2.1705	+0	7	8.0
11	21	25	11.16	2.2233	10	28	11.1	12.540	11	23	10	9.08	2.1708	0	21	8.9
12	21	27	24.49	2.2211	10	15	36.8	12.602	12	23	12	19.34	2.1712	0	35	9.6
13	21	29	37.69	2.2190	10	2	58.9	12.661	13	23	14	29.62	2.1715	0	49	10.2
14	21	31	50.77	2.2168	9	50	17.5	12.719	14	23	16	39.92	2.1720	1	3	10.7
15	21	34	3.71	2.2147	9	37	32.6	12.777	15	23	18	50.26	2.1725	1	17	10.8
16	21	36	16.53	2.2126	9	24	44.3	12.833	16	23	21	0.62	2.1730	1	31	10.6
17	21	38	29.22	2.2106	9	11	52.6	12.888	17	23	23	11.02	2.1738	1	45	10.0
18	21	40	41.80	2.2086	8	58	57.7	12.942	18	23	25	21.47	2.1744	1	59	8.8
19	21	42	54.25	2.2066	8	45	59.6	12.993	19	23	27	31.95	2.1751	2	13	7.0
20	21	45	6.59	2.2047	8	32	58.5	13.044	20	23	29	42.48	2.1760	2	27	4.6
21	21	47	18.81	2.2028	8	19	54.3	13.095	21	23	31	53.07	2.1769	2	41	1.3
22	21	49	30.92	2.2011	8	6	47.1	13.143	22	23	34	3.71	2.1778	2	54	57.3
23	21	51	42.93	2.1992	7	53	37.1	13.190	23	23	36	14.40	2.1788	3	8	52.3
24	21	53	54.82	2.1973	- 7	40	24.3	+13.236	24	23	38	25.16	2.1799	+3	22	46.3

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 30.					JULY 2.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	23 38 25.16	2.1799	+ 3 22 46.3	+13.892	0	1 25 22.95	2.2959	+13 44 33.9	+11.509
1	23 40 35.99	2.1810	3 36 39.3	13.873	1	1 27 40.81	2.2994	13 56 2.0	11.427
2	23 42 46.88	2.1822	3 50 31.1	13.853	2	1 29 58.88	2.3028	14 7 25.1	11.343
3	23 44 57.85	2.1835	4 4 21.6	13.832	3	1 32 17.15	2.3063	14 18 43.2	11.259
4	23 47 8.90	2.1848	4 18 10.9	13.809	4	1 34 35.64	2.3098	14 29 56.2	11.173
5	23 49 20.03	2.1862	4 31 58.7	13.785	5	1 36 54.33	2.3133	14 41 4.0	11.087
6	23 51 31.24	2.1877	4 45 45.1	13.761	6	1 39 13.24	2.3170	14 52 6.6	10.998
7	23 53 42.55	2.1892	4 59 30.0	13.734	7	1 41 32.37	2.3205	15 3 3.8	10.908
8	23 55 53.94	2.1907	5 13 13.2	13.706	8	1 43 51.70	2.3240	15 13 55.6	10.818
9	23 58 5.43	2.1923	5 26 54.7	13.677	9	1 46 11.25	2.3276	15 24 42.0	10.726
10	0 0 17.02	2.1940	5 40 34.4	13.647	10	1 48 31.01	2.3312	15 35 22.7	10.633
11	0 2 28.71	2.1958	5 54 12.3	13.615	11	1 50 50.99	2.3348	15 45 57.9	10.538
12	0 4 40.51	2.1976	6 7 48.2	13.582	12	1 53 11.19	2.3385	15 56 27.3	10.442
13	0 6 52.42	2.1994	6 21 22.1	13.547	13	1 55 31.61	2.3421	16 6 50.9	10.345
14	0 9 4.44	2.2013	6 34 53.8	13.511	14	1 57 52.24	2.3457	16 17 8.7	10.247
15	0 11 16.57	2.2033	6 48 23.4	13.474	15	2 0 13.09	2.3493	16 27 20.5	10.147
16	0 13 28.83	2.2053	7 1 50.7	13.436	16	2 2 34.15	2.3529	16 37 26.3	10.047
17	0 15 41.21	2.2074	7 15 15.7	13.396	17	2 4 55.44	2.3566	16 47 26.1	9.945
18	0 17 53.72	2.2096	7 28 38.2	13.355	18	2 7 16.94	2.3602	16 57 19.7	9.841
19	0 20 6.36	2.2118	7 41 58.3	13.313	19	2 9 38.66	2.3638	17 7 7.0	9.737
20	0 22 19.14	2.2141	7 55 15.7	13.268	20	2 12 0.59	2.3673	17 16 48.1	9.632
21	0 24 32.05	2.2163	8 8 30.5	13.224	21	2 14 22.74	2.3710	17 26 22.8	9.525
22	0 26 45.10	2.2188	8 21 42.6	13.178	22	2 16 45.11	2.3746	17 35 51.1	9.418
23	0 28 58.30	2.2212	+ 8 34 51.9	+13.130	23	2 19 7.69	2.3781	+17 45 12.9	+ 9.308
JULY 1.					JULY 3.				
0	0 31 11.64	2.2236	+ 8 47 58.2	+13.081	0	2 21 30.48	2.3817	+17 54 28.1	+ 9.198
1	0 33 25.13	2.2261	9 1 1.6	13.031	1	2 23 53.49	2.3852	18 3 36.6	9.087
2	0 35 38.77	2.2287	9 14 1.9	12.978	2	2 26 16.70	2.3887	18 12 38.5	8.974
3	0 37 52.57	2.2313	9 26 59.0	12.926	3	2 28 40.13	2.3923	18 21 33.5	8.860
4	0 40 6.53	2.2339	9 39 53.0	12.872	4	2 31 3.77	2.3958	18 30 21.7	8.746
5	0 42 20.64	2.2366	9 52 43.6	12.816	5	2 33 27.62	2.3992	18 39 3.0	8.630
6	0 44 34.92	2.2394	10 5 30.9	12.759	6	2 35 51.67	2.4025	18 47 37.3	8.513
7	0 46 49.37	2.2423	10 18 14.7	12.701	7	2 38 15.92	2.4059	18 56 4.5	8.394
8	0 49 3.99	2.2451	10 30 55.0	12.642	8	2 40 40.38	2.4093	19 4 24.6	8.276
9	0 51 18.78	2.2480	10 43 31.7	12.581	9	2 43 5.04	2.4127	19 12 37.6	8.157
10	0 53 33.75	2.2510	10 56 4.7	12.518	10	2 45 29.90	2.4159	19 20 43.4	8.035
11	0 55 48.90	2.2539	11 8 33.9	12.454	11	2 47 54.95	2.4192	19 28 41.8	7.913
12	0 58 4.22	2.2568	11 20 59.2	12.389	12	2 50 20.20	2.4224	19 36 32.9	7.790
13	1 0 19.72	2.2599	11 33 20.6	12.323	13	2 52 45.64	2.4256	19 44 16.6	7.666
14	1 2 35.41	2.2631	11 45 38.0	12.256	14	2 55 11.27	2.4288	19 51 52.8	7.540
15	1 4 51.29	2.2663	11 57 51.3	12.187	15	2 57 37.09	2.4319	19 59 21.4	7.414
16	1 7 7.36	2.2694	12 10 0.4	12.117	16	3 0 3.10	2.4349	20 6 42.5	7.288
17	1 9 23.62	2.2726	12 22 5.3	12.045	17	3 2 29.28	2.4378	20 13 55.9	7.159
18	1 11 40.07	2.2758	12 34 5.8	11.973	18	3 4 55.64	2.4408	20 21 1.6	7.031
19	1 13 56.71	2.2791	12 46 2.0	11.898	19	3 7 22.17	2.4437	20 27 59.6	6.901
20	1 16 13.56	2.2824	12 57 53.6	11.823	20	3 9 48.88	2.4465	20 34 49.7	6.770
21	1 18 30.60	2.2858	13 9 40.7	11.747	21	3 12 15.75	2.4493	20 41 32.0	6.639
22	1 20 47.85	2.2892	13 21 23.2	11.668	22	3 14 42.79	2.4520	20 48 6.4	6.506
23	1 23 5.30	2.2925	13 33 0.9	11.589	23	3 17 9.99	2.4546	20 54 32.7	6.373
24	1 25 22.95	2.2959	+13 44 33.9	+11.509	24	3 19 37.34	2.4572	+21 0 51.1	

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.
JULY 4.					JULY 6.			
	h m s	s	° ' "	"		h m s	s	° ' "
0	3 19 37.34	2.4572	+21 0 51.1	+6.239	0	5 18 57.66	2.4780	+23 15 50.1
1	3 22 4.85	2.4598	21 7 1.4	6.104	1	5 21 26.28	2.4799	23 15 3.7
2	3 24 32.51	2.4623	21 13 3.6	5.968	2	5 23 54.77	2.4738	23 14 8.8
3	3 27 0.32	2.4646	21 18 57.6	5.833	3	5 26 23.13	2.4715	23 13 4.0
4	3 29 28.26	2.4668	21 24 43.5	5.696	4	5 28 51.35	2.4692	23 11 52.0
5	3 31 56.34	2.4692	21 30 21.1	5.558	5	5 31 19.43	2.4667	23 10 30.9
6	3 34 24.56	2.4713	21 35 50.4	5.419	6	5 33 47.35	2.4641	23 9 1.2
7	3 36 52.90	2.4733	21 41 11.4	5.280	7	5 36 15.12	2.4615	23 7 22.9
8	3 39 21.36	2.4753	21 46 24.0	5.140	8	5 38 42.73	2.4588	23 5 36.1
9	3 41 49.94	2.4773	21 51 28.2	5.000	9	5 41 10.17	2.4559	23 3 40.8
10	3 44 18.63	2.4791	21 56 24.0	4.858	10	5 43 37.44	2.4530	23 1 37.0
11	3 46 47.43	2.4809	22 1 11.2	4.717	11	5 46 4.53	2.4500	22 59 25.0
12	3 49 16.34	2.4827	22 5 50.0	4.575	12	5 48 31.44	2.4469	22 57 4.8
13	3 51 45.35	2.4842	22 10 20.2	4.433	13	5 50 58.16	2.4437	22 54 35.7
14	3 54 14.44	2.4857	22 14 41.9	4.289	14	5 53 24.68	2.4403	22 51 58.0
15	3 56 43.63	2.4872	22 18 54.9	4.145	15	5 55 51.00	2.4369	22 49 13.1
16	3 59 12.90	2.4884	22 22 59.3	4.002	16	5 58 17.11	2.4335	22 46 19.0
17	4 1 42.24	2.4896	22 26 55.1	3.857	17	6 0 43.02	2.4300	22 43 17.0
18	4 4 11.65	2.4908	22 30 42.1	3.712	18	6 3 8.71	2.4263	22 40 8.0
19	4 6 41.14	2.4919	22 34 20.5	3.567	19	6 5 34.17	2.4226	22 36 50.1
20	4 9 10.68	2.4928	22 37 50.1	3.421	20	6 7 59.42	2.4188	22 33 24.5
21	4 11 40.27	2.4937	22 41 11.0	3.275	21	6 10 24.43	2.4149	22 29 50.8
22	4 14 9.92	2.4945	22 44 23.1	3.128	22	6 12 49.21	2.4110	22 26 8.4
23	4 16 39.61	2.4951	+22 47 26.4	+2.982	23	6 15 13.75	2.4069	+22 22 18.7
JULY 5.					JULY 7.			
	h m s	s	° ' "	"		h m s	s	° ' "
0	4 19 9.33	2.4957	+22 50 20.9	+2.835	0	6 17 38.04	2.4028	+22 18 21.5
1	4 21 39.09	2.4962	22 53 6.6	2.688	1	6 20 2.08	2.3987	22 14 15.9
2	4 24 8.87	2.4965	22 55 43.4	2.540	2	6 22 25.88	2.3944	22 10 2.9
3	4 26 38.67	2.4968	22 58 11.4	2.393	3	6 24 49.41	2.3901	22 5 42.5
4	4 29 8.48	2.4969	23 0 30.5	2.244	4	6 27 12.69	2.3858	22 1 14.0
5	4 31 38.30	2.4969	23 2 40.7	2.097	5	6 29 35.70	2.3813	21 56 38.5
6	4 34 8.11	2.4968	23 4 42.1	1.949	6	6 31 58.44	2.3768	21 51 54.9
7	4 36 37.92	2.4968	23 6 34.6	1.801	7	6 34 20.91	2.3722	21 47 4.1
8	4 39 7.72	2.4965	23 8 18.2	1.653	8	6 36 43.10	2.3676	21 42 6.0
9	4 41 37.50	2.4962	23 9 52.9	1.505	9	6 39 5.02	2.3629	21 37 0.6
10	4 44 7.26	2.4958	23 11 18.8	1.357	10	6 41 26.65	2.3582	21 31 47.9
11	4 46 36.99	2.4952	23 12 35.7	1.208	11	6 43 48.00	2.3534	21 26 28.1
12	4 49 6.68	2.4944	23 13 43.8	1.061	12	6 46 9.06	2.3486	21 21 1.1
13	4 51 36.32	2.4936	23 14 43.0	0.913	13	6 48 29.83	2.3437	21 15 27.1
14	4 54 5.91	2.4928	23 15 33.3	0.764	14	6 50 50.30	2.3388	21 9 46.0
15	4 56 35.45	2.4918	23 16 14.7	0.617	15	6 53 10.48	2.3338	21 3 58.0
16	4 59 4.92	2.4906	23 16 47.3	0.469	16	6 55 30.35	2.3287	20 58 3.5
17	5 1 34.32	2.4894	23 17 11.0	0.321	17	6 57 49.92	2.3237	20 52 1.6
18	5 4 3.65	2.4881	23 17 25.8	0.174	18	7 0 9.19	2.3186	20 45 53.5
19	5 6 32.89	2.4867	23 17 31.9	+0.028	19	7 2 28.15	2.3134	20 39 38.1
20	5 9 2.05	2.4852	23 17 29.1	-0.119	20	7 4 46.80	2.3082	20 33 16.4
21	5 11 31.11	2.4835	23 17 17.6	0.266	21	7 7 5.13	2.3030	20 26 48.5
22	5 14 0.07	2.4818	23 16 57.2	0.413	22	7 9 23.16	2.2978	20 20 13.1
23	5 16 28.92	2.4799	23 16 28.1	0.558	23	7 11 40.87	2.2925	20 13 32.5
24	5 18 57.66	2.4780	+23 15 50.3	-0.703	24	7 13 58.26	2.2872	+20 6 44.1

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 8.					JULY 10.				
0	h m s	s	" ' "	"	0	h m s	s	" ' "	"
0	7 13 58.26	2.2872	+20 6 44.9	-6.843	0	8 57 32.86	2.0337	+12 59 29.1	-10.517
1	7 16 15.33	2.2819	19 59 51.2	6.947	1	8 59 34.74	2.0289	12 48 56.6	10.566
2	7 18 32.09	2.2766	19 52 51.3	7.049	2	9 1 36.33	2.0243	12 38 21.2	10.613
3	7 20 48.52	2.2711	19 45 45.3	7.151	3	9 3 37.65	2.0197	12 27 43.0	10.660
4	7 23 4.62	2.2658	19 38 33.2	7.252	4	9 5 38.69	2.0150	12 17 2.0	10.707
5	7 25 20.41	2.2604	19 31 15.1	7.351	5	9 7 39.45	2.0105	12 6 18.2	10.752
6	7 27 35.87	2.2549	19 23 51.1	7.448	6	9 9 39.95	2.0061	11 55 31.8	10.795
7	7 29 51.00	2.2494	19 16 21.3	7.545	7	9 11 40.18	2.0017	11 44 42.8	10.838
8	7 32 5.80	2.2440	19 8 45.7	7.642	8	9 13 40.15	1.9973	11 33 51.2	10.880
9	7 34 20.28	2.2387	19 1 4.3	7.736	9	9 15 39.85	1.9929	11 22 57.2	10.921
10	7 36 34.44	2.2332	18 53 17.4	7.829	10	9 17 39.30	1.9887	11 12 0.7	10.961
11	7 38 48.26	2.2276	18 45 24.8	7.922	11	9 19 38.49	1.9843	11 1 1.9	11.000
12	7 41 1.75	2.2221	18 37 26.8	8.013	12	9 21 37.42	1.9802	10 50 0.7	11.038
13	7 43 14.91	2.2167	18 29 23.3	8.103	13	9 23 36.11	1.9761	10 38 57.3	11.075
14	7 45 27.75	2.2113	18 21 14.5	8.191	14	9 25 34.55	1.9719	10 27 51.7	11.111
15	7 47 40.26	2.2057	18 13 0.4	8.278	15	9 27 32.74	1.9678	10 16 44.0	11.146
16	7 49 52.43	2.2002	18 4 41.1	8.364	16	9 29 30.69	1.9639	10 5 34.2	11.181
17	7 52 4.28	2.1948	17 56 16.7	8.450	17	9 31 28.41	1.9600	9 54 22.3	11.214
18	7 54 15.80	2.1893	17 47 47.1	8.534	18	9 33 25.89	1.9561	9 43 8.5	11.246
19	7 56 26.99	2.1838	17 39 12.6	8.617	19	9 35 23.14	1.9523	9 31 52.8	11.278
20	7 58 37.85	2.1783	17 30 33.1	8.698	20	9 37 20.16	1.9484	9 20 35.2	11.308
21	8 0 48.38	2.1728	17 21 48.8	8.778	21	9 39 16.95	1.9447	9 9 15.8	11.338
22	8 2 58.59	2.1674	17 12 59.7	8.858	22	9 41 13.52	1.9410	8 57 54.7	11.366
23	8 5 8.47	2.1619	+17 4 5.9	-8.936	23	9 43 9.87	1.9374	+ 8 46 31.9	-11.394
JULY 9.					JULY 11.				
0	h m s	s	" ' "	"	0	h m s	s	" ' "	"
0	8 7 18.02	2.1565	+16 55 7.4	-9.013	0	9 45 6.01	1.9339	+ 8 35 7.4	-11.421
1	8 9 27.25	2.1511	16 46 4.4	9.088	1	9 47 1.94	1.9303	8 23 41.4	11.447
2	8 11 36.15	2.1457	16 36 56.9	9.163	2	9 48 57.65	1.9268	8 12 13.8	11.473
3	8 13 44.73	2.1403	16 27 44.9	9.236	3	9 50 53.16	1.9234	8 0 44.7	11.498
4	8 15 52.99	2.1350	16 18 28.6	9.308	4	9 52 48.46	1.9201	7 49 14.1	11.521
5	8 18 0.93	2.1297	16 9 7.9	9.380	5	9 54 43.57	1.9168	7 37 42.2	11.543
6	8 20 8.55	2.1243	15 59 43.0	9.449	6	9 56 38.48	1.9136	7 26 9.0	11.564
7	8 22 15.85	2.1190	15 50 14.0	9.518	7	9 58 33.20	1.9104	7 14 34.5	11.585
8	8 24 22.83	2.1138	15 40 40.9	9.585	8	10 0 27.73	1.9073	7 2 58.8	11.606
9	8 26 29.50	2.1085	15 31 3.8	9.652	9	10 2 22.07	1.9042	6 51 21.8	11.625
10	8 28 35.85	2.1033	15 21 22.7	9.718	10	10 4 16.23	1.9012	6 39 43.8	11.643
11	8 30 41.89	2.0981	15 11 37.7	9.783	11	10 6 10.21	1.8983	6 28 4.7	11.661
12	8 32 47.62	2.0929	15 1 48.8	9.846	12	10 8 4.02	1.8954	6 16 24.5	11.678
13	8 34 53.04	2.0878	14 51 56.2	9.907	13	10 9 57.66	1.8926	6 4 43.4	11.693
14	8 36 58.16	2.0828	14 42 0.0	9.968	14	10 11 51.13	1.8898	5 53 1.3	11.709
15	8 39 2.97	2.0776	14 32 0.1	10.028	15	10 13 44.43	1.8870	5 41 18.3	11.723
16	8 41 7.47	2.0726	14 21 56.7	10.086	16	10 15 37.57	1.8844	5 29 34.5	11.737
17	8 43 11.68	2.0676	14 11 49.8	10.143	17	10 17 30.56	1.8818	5 17 49.9	11.750
18	8 45 15.58	2.0626	14 1 39.5	10.200	18	10 19 23.39	1.8793	5 6 4.5	11.763
19	8 47 19.19	2.0578	13 51 25.8	10.256	19	10 21 16.07	1.8768	4 54 18.4	11.773
20	8 49 22.51	2.0528	13 41 8.8	10.311	20	10 23 8.60	1.8743	4 42 31.7	11.784
21	8 51 25.53	2.0479	13 30 48.5	10.364	21	10 25 0.99	1.8720	4 30 44.3	11.795
22	8 53 28.26	2.0431	13 20 25.1	10.416	22	10 26 53.24	1.8697	4 18 56.3	11.803
23	8 55 30.70	2.0383	13 9 58.6	10.467	23	10 28 45.35	1.8674	4 7 7.9	11.812
24	8 57 32.86	2.0337	+12 59 29.1	-10.517	24	10 30 37.33	1.8653	+ 3 55 18.9	

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	
JULY 12.									JULY 14.									
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"	
0	10	30	37.33	1.8653	+3	55	18.9	-11.820	0	11	58	48.12	1.8323	-	5	28	3.7	-11.820
1	10	32	29.18	1.8632	3	43	29.5	11.827	1	12	0	38.08	1.8332	5	39	27.6	11.827	
2	10	34	20.91	1.8612	3	31	39.7	11.833	2	12	2	28.10	1.8340	5	50	50.0	11.833	
3	10	36	12.52	1.8591	3	19	49.5	11.839	3	12	4	18.16	1.8349	6	2	11.0	11.839	
4	10	38	4.00	1.8571	3	7	59.0	11.843	4	12	6	8.29	1.8359	6	13	30.5	11.843	
5	10	39	55.37	1.8553	2	56	8.3	11.848	5	12	7	58.47	1.8369	6	24	48.4	11.848	
6	10	41	46.64	1.8535	2	44	17.3	11.851	6	12	9	48.72	1.8381	6	36	4.8	11.851	
7	10	43	37.79	1.8517	2	32	26.2	11.854	7	12	11	39.04	1.8393	6	47	19.5	11.854	
8	10	45	28.84	1.8500	2	20	34.8	11.857	8	12	13	29.43	1.8404	6	58	32.6	11.857	
9	10	47	19.79	1.8484	2	8	43.4	11.857	9	12	15	19.89	1.8417	7	9	44.0	11.857	
10	10	49	10.65	1.8468	1	56	52.0	11.858	10	12	17	10.43	1.8430	7	20	53.7	11.858	
11	10	51	1.41	1.8453	1	45	0.5	11.858	11	12	19	1.05	1.8444	7	32	1.6	11.858	
12	10	52	52.08	1.8438	1	33	9.0	11.858	12	12	20	51.76	1.8459	7	43	7.7	11.858	
13	10	54	42.67	1.8425	1	21	17.6	11.856	13	12	22	42.56	1.8473	7	54	12.0	11.856	
14	10	56	33.18	1.8412	1	9	26.3	11.853	14	12	24	33.44	1.8489	8	5	14.4	11.853	
15	10	58	23.61	1.8398	0	57	35.2	11.850	15	12	26	24.43	1.8506	8	16	14.9	11.850	
16	11	0	13.96	1.8386	0	45	44.3	11.848	16	12	28	15.51	1.8522	8	27	13.5	11.848	
17	11	2	4.24	1.8375	0	33	53.5	11.843	17	12	30	6.69	1.8539	8	38	10.0	11.843	
18	11	3	54.46	1.8364	0	22	3.1	11.838	18	12	31	57.98	1.8558	8	49	4.6	11.838	
19	11	5	44.61	1.8354	+0	10	12.9	11.834	19	12	33	49.38	1.8576	8	59	57.1	11.834	
20	11	7	34.71	1.8345	-0	1	37.0	11.828	20	12	35	40.89	1.8595	9	10	47.6	11.828	
21	11	9	24.75	1.8336	0	13	26.5	11.822	21	12	37	32.52	1.8615	9	21	35.9	11.822	
22	11	11	14.74	1.8328	0	25	15.6	11.814	22	12	39	24.27	1.8635	9	32	22.0	11.814	
23	11	13	4.68	1.8319	-0	37	4.2	-11.806	23	12	41	16.14	1.8656	-	9	43	5.9	-11.806
JULY 13.									JULY 15.									
0	11	14	54.57	1.8313	-0	48	52.3	-11.798	0	12	43	8.14	1.8678	-	9	53	47.6	-11.798
1	11	16	44.43	1.8306	1	0	39.9	11.788	1	12	45	0.27	1.8699	10	4	27.0	11.788	
2	11	18	34.24	1.8299	1	12	26.9	11.778	2	12	46	52.53	1.8721	10	15	4.1	11.778	
3	11	20	24.02	1.8295	1	24	13.3	11.768	3	12	48	44.92	1.8744	10	25	38.9	11.768	
4	11	22	13.78	1.8290	1	35	59.1	11.758	4	12	50	37.46	1.8768	10	36	11.2	11.758	
5	11	24	3.50	1.8286	1	47	44.2	11.746	5	12	52	30.14	1.8792	10	46	41.2	11.746	
6	11	25	53.21	1.8283	1	59	28.6	11.734	6	12	54	22.96	1.8817	10	57	8.6	11.734	
7	11	27	42.89	1.8279	2	11	12.3	11.721	7	12	56	15.94	1.8842	11	7	33.6	11.721	
8	11	29	32.56	1.8278	2	22	55.1	11.707	8	12	58	9.06	1.8867	11	17	56.1	11.707	
9	11	31	22.22	1.8275	2	34	37.1	11.693	9	13	0	2.34	1.8893	11	28	15.9	11.693	
10	11	33	11.86	1.8274	2	46	18.3	11.679	10	13	1	55.78	1.8920	11	38	33.2	11.679	
11	11	35	1.51	1.8274	2	57	58.6	11.663	11	13	3	49.38	1.8948	11	48	47.7	11.663	
12	11	36	51.15	1.8274	3	9	37.9	11.648	12	13	5	43.15	1.8976	11	58	59.6	11.648	
13	11	38	40.80	1.8275	3	21	16.3	11.631	13	13	7	37.09	1.9003	12	9	8.8	11.631	
14	11	40	30.45	1.8276	3	32	53.6	11.613	14	13	9	31.19	1.9032	12	19	15.1	11.613	
15	11	42	20.11	1.8278	3	44	29.9	11.596	15	13	11	25.47	1.9062	12	29	18.7	11.596	
16	11	44	9.79	1.8281	3	56	5.1	11.578	16	13	13	19.93	1.9092	12	39	19.4	11.578	
17	11	45	59.48	1.8283	4	7	39.2	11.559	17	13	15	14.57	1.9122	12	49	17.2	11.559	
18	11	47	49.19	1.8288	4	19	12.2	11.540	18	13	17	9.39	1.9153	12	59	12.1	11.540	
19	11	49	38.93	1.8293	4	30	44.0	11.519	19	13	19	4.40	1.9183	13	9	3.9	11.519	
20	11	51	28.70	1.8298	4	42	14.5	11.498	20	13	20	59.59	1.9215	13	18	52.8	11.498	
21	11	53	18.50	1.8303	4	53	43.8	11.478	21	13	22	54.98	1.9248	13	28	38.6	11.478	
22	11	55	8.33	1.8308	5	5	11.8	11.455	22	13	24	50.57	1.9281	13	38	21.3	11.455	
23	11	56	58.20	1.8316	5	16	38.4	11.433	23	13	26	46.35	1.9313	13	48	0.8	11.433	
24	11	58	48.12	1.8323	-5	28	3.7	-11.410	24	13	28	42.33	1.9348	-	13	57	37.2	-11.410

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 16.					JULY 18.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	13 28 42.33	1.9348	-13 57 37.2	-9.579	0	15 6 11.24	2.1380	-20 21 30.8	-6.110
1	13 30 38.52	1.9382	14 7 10.3	9.524	1	15 8 19.66	2.1427	20 27 34.6	6.018
2	13 32 34.91	1.9416	14 16 40.1	9.469	2	15 10 28.36	2.1474	20 33 32.9	5.925
3	13 34 31.51	1.9452	14 26 6.6	9.414	3	15 12 37.35	2.1522	20 39 25.6	5.830
4	13 36 28.33	1.9487	14 35 29.8	9.358	4	15 14 46.62	2.1568	20 45 12.5	5.735
5	13 38 25.35	1.9523	14 44 49.6	9.301	5	15 16 56.17	2.1616	20 50 53.8	5.639
6	13 40 22.60	1.9559	14 54 5.9	9.243	6	15 19 6.01	2.1663	20 56 29.2	5.542
7	13 42 20.06	1.9596	15 3 18.7	9.184	7	15 21 16.13	2.1710	21 1 58.8	5.445
8	13 44 17.75	1.9633	15 12 28.0	9.125	8	15 23 26.53	2.1758	21 7 22.6	5.347
9	13 46 15.66	1.9671	15 21 33.7	9.065	9	15 25 37.22	2.1805	21 12 40.4	5.247
10	13 48 13.80	1.9709	15 30 35.8	9.005	10	15 27 48.19	2.1851	21 17 52.2	5.147
11	13 50 12.17	1.9748	15 39 34.3	8.943	11	15 29 59.43	2.1898	21 22 58.0	5.046
12	13 52 10.77	1.9786	15 48 29.0	8.881	12	15 32 10.96	2.1945	21 27 57.7	4.944
13	13 54 9.60	1.9825	15 57 20.0	8.818	13	15 34 22.77	2.1992	21 32 51.3	4.842
14	13 56 8.67	1.9865	16 6 7.2	8.754	14	15 36 34.86	2.2038	21 37 38.7	4.738
15	13 58 7.98	1.9905	16 14 50.5	8.689	15	15 38 47.22	2.2083	21 42 19.8	4.633
16	14 0 7.53	1.9946	16 23 29.9	8.624	16	15 40 59.86	2.2130	21 46 54.7	4.528
17	14 2 7.33	1.9987	16 32 5.4	8.559	17	15 43 12.78	2.2176	21 51 23.2	4.422
18	14 4 7.37	2.0028	16 40 37.0	8.493	18	15 45 25.97	2.2222	21 55 45.3	4.315
19	14 6 7.66	2.0068	16 49 4.5	8.424	19	15 47 39.44	2.2267	22 0 1.0	4.207
20	14 8 8.19	2.0110	16 57 27.9	8.356	20	15 49 53.17	2.2311	22 4 10.1	4.098
21	14 10 8.98	2.0153	17 5 47.2	8.287	21	15 52 7.17	2.2357	22 8 12.8	3.990
22	14 12 10.02	2.0195	17 14 2.3	8.217	22	15 54 21.45	2.2402	22 12 8.9	3.879
23	14 14 11.32	2.0238	-17 22 13.2	-8.146	23	15 56 35.99	2.2445	-22 15 58.3	-3.768
JULY 17.					JULY 19.				
0	14 16 12.88	2.0282	-17 30 19.8	-8.074	0	15 58 50.79	2.2489	-22 19 41.0	-3.656
1	14 18 14.70	2.0324	17 38 22.1	8.003	1	16 1 5.86	2.2533	22 23 17.0	3.543
2	14 20 16.77	2.0368	17 46 20.1	7.929	2	16 3 21.18	2.2576	22 26 46.2	3.430
3	14 22 19.11	2.0412	17 54 13.6	7.855	3	16 5 36.77	2.2620	22 30 8.6	3.316
4	14 24 21.71	2.0456	18 2 2.7	7.780	4	16 7 52.62	2.2662	22 33 24.1	3.201
5	14 26 24.58	2.0501	18 9 47.2	7.704	5	16 10 8.71	2.2703	22 36 32.7	3.085
6	14 28 27.72	2.0545	18 17 27.2	7.628	6	16 12 25.06	2.2746	22 39 34.3	2.969
7	14 30 31.12	2.0590	18 25 2.6	7.552	7	16 14 41.66	2.2788	22 42 29.0	2.852
8	14 32 34.80	2.0636	18 32 33.4	7.473	8	16 16 58.51	2.2828	22 45 16.5	2.733
9	14 34 38.75	2.0681	18 39 59.4	7.394	9	16 19 15.60	2.2868	22 47 56.9	2.614
10	14 36 42.97	2.0726	18 47 20.7	7.315	10	16 21 32.93	2.2908	22 50 30.2	2.495
11	14 38 47.46	2.0772	18 54 37.2	7.234	11	16 23 50.50	2.2948	22 52 56.3	2.375
12	14 40 52.23	2.0818	19 1 48.8	7.153	12	16 26 8.31	2.2988	22 55 15.2	2.254
13	14 42 57.27	2.0863	19 8 55.5	7.070	13	16 28 26.35	2.3027	22 57 26.8	2.132
14	14 45 2.59	2.0910	19 15 57.2	6.988	14	16 30 44.63	2.3065	22 59 31.0	2.009
15	14 47 8.19	2.0957	19 22 54.0	6.904	15	16 33 3.13	2.3102	23 1 27.9	1.887
16	14 49 14.07	2.1003	19 29 45.7	6.818	16	16 35 21.85	2.3138	23 3 17.4	1.763
17	14 51 20.23	2.1050	19 36 32.2	6.733	17	16 37 40.79	2.3176	23 4 59.4	1.638
18	14 53 26.67	2.1097	19 43 13.6	6.647	18	16 39 59.96	2.3212	23 6 34.0	1.513
19	14 55 33.39	2.1144	19 49 49.8	6.559	19	16 42 19.33	2.3247	23 8 1.0	1.388
20	14 57 40.40	2.1191	19 56 20.7	6.472	20	16 44 38.92	2.3282	23 9 20.5	1.261
21	14 59 47.68	2.1238	20 2 46.4	6.383	21	16 46 58.71	2.3316	23 10 32.3	1.133
22	15 1 55.25	2.1285	20 9 6.6	6.292	22	16 49 18.71	2.3349	23 11 36.5	1.007
23	15 4 3.10	2.1333	20 15 21.4	6.202	23	16 51 38.90	2.3382	23 12 33.1	0.879
24	15 6 11.24	2.1380	-20 21 30.8	-6.110	24	16 53 59.29	2.3414	-23 13 22.0	-0.750

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 20.					JULY 22.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 53 59.29	2.3414	-23 13 22.0	-0.750	0	18 48 41.00	2.4073	-21 14 23.8	+ 5.732
1	16 56 19.87	2.3446	23 14 3.1	0.621	1	18 51 5.42	2.4068	21 8 34.7	5.885
2	16 58 40.64	2.3477	23 14 36.5	0.491	2	18 53 29.81	2.4062	21 2 37.6	6.018
3	17 1 1.59	2.3507	23 15 2.0	0.361	3	18 55 54.16	2.4055	20 56 32.5	6.152
4	17 3 22.72	2.3537	23 15 19.8	0.230	4	18 58 18.47	2.4048	20 50 19.4	6.284
5	17 5 44.03	2.3566	23 15 29.6	-0.098	5	19 0 42.73	2.4039	20 43 58.4	6.417
6	17 8 5.51	2.3593	23 15 31.6	+0.033	6	19 3 6.94	2.4031	20 37 29.4	6.548
7	17 10 27.15	2.3621	23 15 25.7	0.165	7	19 5 31.10	2.4022	20 30 52.6	6.678
8	17 12 48.96	2.3648	23 15 11.8	0.298	8	19 7 55.20	2.4012	20 24 8.0	6.808
9	17 15 10.93	2.3674	23 14 49.9	0.431	9	19 10 19.24	2.4001	20 17 15.6	6.938
10	17 17 33.05	2.3699	23 14 20.1	0.564	10	19 12 43.21	2.3989	20 10 15.4	7.068
11	17 19 55.32	2.3723	23 13 42.2	0.698	11	19 15 7.11	2.3978	20 3 7.4	7.197
12	17 22 17.73	2.3748	23 12 56.3	0.833	12	19 17 30.94	2.3965	19 55 51.8	7.324
13	17 24 40.29	2.3771	23 12 2.3	0.967	13	19 19 54.69	2.3952	19 48 28.5	7.452
14	17 27 2.98	2.3793	23 11 0.3	1.102	14	19 22 18.36	2.3938	19 40 57.6	7.578
15	17 29 25.80	2.3814	23 9 50.1	1.238	15	19 24 41.95	2.3924	19 33 19.1	7.704
16	17 31 48.75	2.3835	23 8 31.7	1.373	16	19 27 5.45	2.3909	19 25 33.1	7.829
17	17 34 11.82	2.3855	23 7 5.3	1.508	17	19 29 28.86	2.3894	19 17 39.6	7.953
18	17 36 35.01	2.3874	23 5 30.7	1.645	18	19 31 52.18	2.3878	19 9 38.7	8.077
19	17 38 58.31	2.3892	23 3 47.9	1.782	19	19 34 15.40	2.3862	19 1 30.4	8.200
20	17 41 21.71	2.3909	23 1 56.9	1.918	20	19 36 38.52	2.3845	18 53 14.7	8.323
21	17 43 45.22	2.3927	22 59 57.7	2.056	21	19 39 1.54	2.3828	18 44 51.7	8.443
22	17 46 8.83	2.3943	22 57 50.2	2.193	22	19 41 24.46	2.3811	18 36 21.5	8.563
23	17 48 32.53	2.3958	-22 55 34.6	+2.329	23	19 43 47.27	2.3793	-18 27 44.1	+ 8.683
JULY 21.					JULY 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 50 56.32	2.3972	-22 53 10.7	+2.468	0	19 46 9.97	2.3774	-18 18 59.6	+ 8.801
1	17 53 20.19	2.3985	22 50 38.5	2.605	1	19 48 32.56	2.3756	18 10 8.0	8.919
2	17 55 44.14	2.3998	22 47 58.1	2.742	2	19 50 55.04	2.3737	18 1 9.3	9.036
3	17 58 8.17	2.4010	22 45 9.5	2.880	3	19 53 17.40	2.3717	17 52 3.7	9.151
4	18 0 32.26	2.4020	22 42 12.5	3.018	4	19 55 39.64	2.3697	17 42 51.2	9.266
5	18 2 56.41	2.4030	22 39 7.3	3.156	5	19 58 1.76	2.3677	17 33 31.8	9.380
6	18 5 20.62	2.4040	22 35 53.8	3.293	6	20 0 23.76	2.3656	17 24 5.6	9.493
7	18 7 44.89	2.4049	22 32 32.1	3.431	7	20 2 45.63	2.3635	17 14 32.6	9.605
8	18 10 9.21	2.4057	22 29 2.1	3.569	8	20 5 7.38	2.3614	17 4 53.0	9.715
9	18 12 33.57	2.4063	22 25 23.8	3.707	9	20 7 29.00	2.3593	16 55 6.8	9.826
10	18 14 57.97	2.4069	22 21 37.3	3.844	10	20 9 50.49	2.3571	16 45 13.9	9.935
11	18 17 22.40	2.4074	22 17 42.5	3.982	11	20 12 11.85	2.3549	16 35 14.6	10.042
12	18 19 46.86	2.4079	22 13 39.5	4.119	12	20 14 33.08	2.3527	16 25 8.9	10.148
13	18 22 11.35	2.4083	22 9 28.2	4.257	13	20 16 54.17	2.3504	16 14 56.8	10.253
14	18 24 35.85	2.4085	22 5 8.7	4.393	14	20 19 15.13	2.3483	16 4 38.5	10.358
15	18 27 0.37	2.4088	22 0 41.0	4.530	15	20 21 35.96	2.3460	15 54 13.9	10.461
16	18 29 24.91	2.4090	21 56 5.1	4.668	16	20 23 56.65	2.3436	15 43 43.2	10.563
17	18 31 49.45	2.4090	21 51 20.9	4.804	17	20 26 17.19	2.3413	15 33 6.3	10.664
18	18 34 13.99	2.4089	21 46 28.6	4.940	18	20 28 37.60	2.3391	15 22 23.5	10.763
19	18 36 38.52	2.4088	21 41 28.1	5.076	19	20 30 57.88	2.3368	15 11 34.7	10.863
20	18 39 3.05	2.4088	21 36 19.5	5.212	20	20 33 18.01	2.3343	15 0 40.0	10.960
21	18 41 27.57	2.4085	21 31 2.7	5.348	21	20 35 38.00	2.3320	14 49 39.5	11.056
22	18 43 52.07	2.4082	21 25 37.8	5.482	22	20 37 57.85	2.3296	14 38 33.3	11.151
23	18 46 16.55	2.4078	21 20 4.9	5.617	23	20 40 17.55	2.3273	14 27 21.4	11.244
24	18 48 41.00	2.4073	-21 14 23.8	+5.732	24	20 42 37.12	2.3250	-14 16 4.0	+11.336

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 24.					JULY 26.				
0	h m s	s	" "	" "	0	h m s	s	" "	" "
0	20 42 37.12	2.3250	-14 16 4.0	+11.336	0	22 31 45.74	2.2337	-3 51 29.5	+14.133
1	20 44 56.55	2.3226	14 4 41.1	11.428	1	22 33 59.73	2.2327	3 37 20.8	14.156
2	20 47 15.83	2.3202	13 53 12.7	11.518	2	22 36 13.66	2.2317	3 23 10.8	14.177
3	20 49 34.97	2.3178	13 41 39.0	11.606	3	22 38 27.53	2.2308	3 8 59.6	14.196
4	20 51 53.97	2.3155	13 30 0.0	11.693	4	22 40 41.35	2.2299	2 54 47.3	14.213
5	20 54 12.83	2.3132	13 18 15.9	11.778	5	22 42 55.12	2.2291	2 40 34.0	14.229
6	20 56 31.55	2.3108	13 6 26.6	11.863	6	22 45 8.84	2.2283	2 26 19.8	14.244
7	20 58 50.13	2.3084	12 54 32.3	11.947	7	22 47 22.52	2.2276	2 12 4.7	14.258
8	21 1 8.56	2.3061	12 42 33.0	12.029	8	22 49 36.15	2.2269	1 57 48.9	14.269
9	21 3 26.86	2.3038	12 30 28.8	12.110	9	22 51 49.75	2.2264	1 43 32.4	14.279
10	21 5 45.02	2.3015	12 18 19.8	12.189	10	22 54 3.32	2.2258	1 29 15.4	14.288
11	21 8 3.04	2.2992	12 6 6.1	12.267	11	22 56 16.85	2.2253	1 14 57.9	14.295
12	21 10 20.92	2.2969	11 53 47.8	12.343	12	22 58 30.35	2.2248	1 0 40.0	14.301
13	21 12 38.67	2.2947	11 41 25.0	12.418	13	23 0 43.83	2.2245	0 46 21.8	14.304
14	21 14 56.28	2.2923	11 28 57.7	12.492	14	23 2 57.29	2.2242	0 32 3.5	14.307
15	21 17 13.75	2.2902	11 16 26.0	12.564	15	23 5 10.73	2.2238	0 17 45.0	14.308
16	21 19 31.10	2.2880	11 3 50.0	12.635	16	23 7 24.15	2.2236	-0 3 26.5	14.308
17	21 21 48.31	2.2857	10 51 9.8	12.704	17	23 9 37.56	2.2234	+0 10 51.9	14.306
18	21 24 5.38	2.2835	10 38 25.5	12.773	18	23 11 50.96	2.2233	0 25 10.2	14.303
19	21 26 22.33	2.2814	10 25 37.1	12.839	19	23 14 4.36	2.2233	0 39 28.2	14.298
20	21 28 39.15	2.2793	10 12 44.8	12.904	20	23 16 17.75	2.2233	0 53 45.9	14.292
21	21 30 55.85	2.2773	9 59 48.6	12.968	21	23 18 31.15	2.2233	1 8 3.2	14.283
22	21 33 12.42	2.2751	9 46 48.7	13.030	22	23 20 44.55	2.2233	1 22 19.9	14.274
23	21 35 28.86	2.2730	-9 33 45.0	+13.092	23	23 22 57.95	2.2235	+1 36 36.1	+14.263
JULY 25.					JULY 27.				
0	21 37 45.18	2.2710	-9 20 37.7	+13.151	0	23 25 11.37	2.2238	+1 50 51.5	+14.251
1	21 40 1.38	2.2690	9 7 26.9	13.208	1	23 27 24.80	2.2240	2 5 6.2	14.238
2	21 42 17.46	2.2671	8 54 12.7	13.265	2	23 29 38.25	2.2243	2 19 20.0	14.223
3	21 44 33.43	2.2653	8 40 55.1	13.320	3	23 31 51.72	2.2247	2 33 32.9	14.206
4	21 46 49.29	2.2633	8 27 34.3	13.374	4	23 34 5.21	2.2252	2 47 44.7	14.188
5	21 49 5.03	2.2614	8 14 10.2	13.427	5	23 36 18.74	2.2257	3 1 55.5	14.169
6	21 51 20.66	2.2596	8 0 43.1	13.476	6	23 38 32.29	2.2262	3 16 5.0	14.148
7	21 53 36.18	2.2578	7 47 13.1	13.525	7	23 40 45.88	2.2268	3 30 13.2	14.125
8	21 55 51.59	2.2560	7 33 40.1	13.574	8	23 42 59.50	2.2273	3 44 20.0	14.101
9	21 58 6.90	2.2543	7 20 4.2	13.620	9	23 45 13.16	2.2281	3 58 25.3	14.075
10	22 0 22.11	2.2527	7 6 25.7	13.664	10	23 47 26.87	2.2289	4 12 29.0	14.048
11	22 2 37.22	2.2510	6 52 44.5	13.708	11	23 49 40.63	2.2297	4 26 31.1	14.021
12	22 4 52.23	2.2494	6 39 0.7	13.750	12	23 51 54.43	2.2305	4 40 31.5	13.991
13	22 7 7.15	2.2479	6 25 14.5	13.790	13	23 54 8.29	2.2314	4 54 30.0	13.960
14	22 9 21.98	2.2463	6 11 25.9	13.829	14	23 56 22.20	2.2324	5 8 26.7	13.928
15	22 11 36.71	2.2448	5 57 35.0	13.866	15	23 58 36.18	2.2335	5 22 21.3	13.893
16	22 13 51.36	2.2435	5 43 42.0	13.902	16	0 0 50.22	2.2345	5 36 13.9	13.858
17	22 16 5.93	2.2421	5 29 46.8	13.936	17	0 3 4.32	2.2356	5 50 4.3	13.822
18	22 18 20.41	2.2407	5 15 49.7	13.968	18	0 5 18.49	2.2368	6 3 52.5	13.783
19	22 20 34.81	2.2394	5 1 50.6	14.000	19	0 7 32.74	2.2381	6 17 38.3	13.743
20	22 22 49.14	2.2383	4 47 49.7	14.030	20	0 9 47.06	2.2393	6 31 21.7	13.703
21	22 25 3.40	2.2370	4 33 47.0	14.058	21	0 12 1.45	2.2406	6 45 2.6	13.660
22	22 27 17.58	2.2358	4 19 42.7	14.085	22	0 14 15.93	2.2420	6 58 40.9	13.617
23	22 29 31.69	2.2347	4 5 36.8	14.110	23	0 16 30.49	2.2434	7 12 16.6	13.572
24	22 31 45.74	2.2337	-3 51 29.5	+14.133	24	0 18 45.14	2.2449	+7 25 49.5	+13.521

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	
JULY 28.					JULY 30.				
0	h m s	s	" ' "	"	0	h m s	s	" ' "	
0	0 18 45.14	2.2449	+ 7 25 49.5	+13.525	0	2 8 56.66	2.3566	+16 56 10.0	
1	0 20 59.88	2.2464	7 39 19.6	13.477	1	2 11 18.14	2.3593	17 5 52.4	
2	0 23 14.71	2.2480	7 52 46.7	13.427	2	2 13 39.78	2.3620	17 15 28.4	
3	0 25 29.64	2.2496	8 6 10.8	13.376	3	2 16 1.58	2.3647	17 24 57.8	
4	0 27 44.66	2.2513	8 19 31.8	13.324	4	2 18 23.54	2.3674	17 34 20.6	
5	0 29 59.79	2.2530	8 32 49.7	13.271	5	2 20 45.67	2.3701	17 43 36.7	
6	0 32 15.02	2.2547	8 46 4.3	13.216	6	2 23 7.95	2.3728	17 52 46.2	
7	0 34 30.35	2.2565	8 59 15.6	13.160	7	2 25 30.40	2.3754	18 1 48.8	
8	0 36 45.80	2.2584	9 12 23.5	13.103	8	2 27 53.00	2.3780	18 10 44.7	
9	0 39 1.36	2.2603	9 25 27.9	13.043	9	2 30 15.76	2.3806	18 19 33.6	
10	0 41 17.03	2.2622	9 38 28.7	12.983	10	2 32 38.67	2.3833	18 28 15.5	
11	0 43 32.82	2.2642	9 51 25.9	12.922	11	2 35 1.75	2.3858	18 36 50.5	
12	0 45 48.73	2.2662	10 4 19.3	12.858	12	2 37 24.97	2.3883	18 45 18.4	
13	0 48 4.76	2.2682	10 17 8.9	12.794	13	2 39 48.35	2.3909	18 53 39.2	
14	0 50 20.91	2.2703	10 29 54.6	12.729	14	2 42 11.88	2.3934	19 1 52.8	
15	0 52 37.19	2.2724	10 42 36.4	12.663	15	2 44 35.56	2.3958	19 9 59.1	
16	0 54 53.60	2.2746	10 55 14.1	12.593	16	2 46 59.38	2.3983	19 17 58.2	
17	0 57 10.14	2.2768	11 7 47.6	12.524	17	2 49 23.35	2.4008	19 25 50.0	
18	0 59 26.82	2.2791	11 20 17.0	12.454	18	2 51 47.47	2.4031	19 33 34.4	
19	1 1 43.63	2.2813	11 32 42.1	12.382	19	2 54 11.72	2.4054	19 41 11.4	
20	1 4 0.57	2.2836	11 45 2.8	12.308	20	2 56 36.12	2.4078	19 48 40.8	
21	1 6 17.66	2.2859	11 57 19.0	12.233	21	2 59 0.65	2.4099	19 56 2.8	
22	1 8 34.88	2.2883	12 9 30.8	12.158	22	3 1 25.31	2.4122	20 3 17.2	
23	1 10 52.25	2.2907	+12 21 37.9	+12.080	23	3 3 50.11	2.4143	+20 10 23.9	
JULY 29.					JULY 31.				
0	1 13 9.76	2.2931	+12 33 40.4	+12.002	0	3 6 15.03	2.4164	+20 17 23.0	
1	1 15 27.42	2.2955	12 45 38.1	11.922	1	3 8 40.08	2.4186	20 24 14.4	
2	1 17 45.22	2.2980	12 57 31.0	11.841	2	3 11 5.26	2.4207	20 30 58.0	
3	1 20 3.18	2.3005	13 9 19.0	11.759	3	3 13 30.56	2.4227	20 37 33.8	
4	1 22 21.28	2.3030	13 21 2.1	11.676	4	3 15 55.98	2.4246	20 44 1.8	
5	1 24 39.54	2.3056	13 32 40.1	11.591	5	3 18 21.51	2.4264	20 50 21.9	
6	1 26 57.95	2.3082	13 44 13.0	11.505	6	3 20 47.15	2.4283	20 56 34.1	
7	1 29 16.52	2.3108	13 55 40.7	11.418	7	3 23 12.90	2.4301	21 2 38.4	
8	1 31 35.24	2.3133	14 7 3.2	11.330	8	3 25 38.76	2.4318	21 8 34.6	
9	1 33 54.12	2.3160	14 18 20.3	11.240	9	3 28 4.72	2.4335	21 14 22.3	
10	1 36 13.16	2.3186	14 29 32.0	11.150	10	3 30 30.78	2.4351	21 20 3.1	
11	1 38 32.35	2.3213	14 40 38.3	11.058	11	3 32 56.93	2.4367	21 25 35.1	
12	1 40 51.71	2.3240	14 51 39.0	10.965	12	3 35 23.18	2.4382	21 30 59.1	
13	1 43 11.23	2.3267	15 2 34.1	10.871	13	3 37 49.51	2.4396	21 36 14.9	
14	1 45 30.91	2.3293	15 13 23.5	10.776	14	3 40 15.93	2.4409	21 41 22.3	
15	1 47 50.75	2.3320	15 24 7.2	10.679	15	3 42 42.42	2.4422	21 46 21.9	
16	1 50 10.75	2.3347	15 34 45.0	10.581	16	3 45 8.99	2.4435	21 51 13.0	
17	1 52 30.91	2.3374	15 45 16.9	10.483	17	3 47 35.64	2.4447	21 55 55.9	
18	1 54 51.24	2.3403	15 55 42.9	10.383	18	3 50 2.35	2.4457	22 0 30.3	
19	1 57 11.74	2.3429	16 6 2.9	10.283	19	3 52 29.12	2.4467	22 4 56.7	
20	1 59 32.39	2.3456	16 16 16.8	10.180	20	3 54 55.95	2.4477	22 9 14.6	
21	2 1 53.21	2.3484	16 26 24.5	10.076	21	3 57 22.84	2.4486	22 13 24.1	
22	2 4 14.20	2.3512	16 36 25.9	9.972	22	3 59 49.78	2.4494	22 17 25.5	
23	2 6 35.35	2.3538	16 46 21.1	9.868	23	4 2 16.77	2.4501	22 21 18.0	
24	2 8 56.66	2.3566	+16 56 10.0	+ 9.761	24	4 4 43.79	2.4507	+22 25 2.5	

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	
AUGUST 1.							AUGUST 3.							
	h	m	s	s	"	"		h	m	s	s	"	"	
0	4	4	43.79	2.4507	+22 25	2.3	+3.668	0	6	1	31.66	2.3838	+22 38 33.9	-3.015
1	4	7	10.85	2.4513	22 28	38.2	3.528	1	6	3	54.59	2.3804	22 35 29.1	3.145
2	4	9	37.94	2.4518	22 32	5.6	3.386	2	6	6	17.31	2.3770	22 32 16.5	3.274
3	4	12	5.06	2.4522	22 35	24.5	3.244	3	6	8	39.83	2.3735	22 28 56.2	3.403
4	4	14	32.20	2.4525	22 38	34.9	3.103	4	6	11	2.13	2.3699	22 25 28.2	3.530
5	4	16	59.36	2.4528	22 41	36.9	2.962	5	6	13	24.22	2.3664	22 21 52.6	3.657
6	4	19	26.53	2.4529	22 44	30.3	2.819	6	6	15	46.10	2.3628	22 18 9.4	3.783
7	4	21	53.71	2.4530	22 47	15.2	2.678	7	6	18	7.75	2.3589	22 14 18.7	3.908
8	4	24	20.89	2.4530	22 49	51.6	2.535	8	6	20	29.17	2.3551	22 10 20.5	4.032
9	4	26	48.07	2.4529	22 52	19.4	2.393	9	6	22	50.36	2.3513	22 6 14.9	4.155
10	4	29	15.24	2.4528	22 54	38.7	2.250	10	6	25	11.32	2.3474	22 2 1.9	4.278
11	4	31	42.40	2.4525	22 56	49.4	2.108	11	6	27	32.05	2.3435	21 57 41.5	4.400
12	4	34	9.54	2.4522	22 58	51.6	1.965	12	6	29	52.54	2.3395	21 53 13.9	4.521
13	4	36	36.66	2.4518	23 0	45.2	1.823	13	6	32	12.79	2.3354	21 48 39.0	4.641
14	4	39	3.75	2.4513	23 2	30.3	1.681	14	6	34	32.79	2.3313	21 43 57.0	4.760
15	4	41	30.81	2.4507	23 4	6.9	1.538	15	6	36	52.54	2.3271	21 39 7.8	4.879
16	4	43	57.83	2.4500	23 5	34.8	1.395	16	6	39	12.04	2.3229	21 34 11.5	4.996
17	4	46	24.81	2.4492	23 6	54.3	1.253	17	6	41	31.29	2.3187	21 29 8.3	5.113
18	4	48	51.73	2.4483	23 8	5.2	1.110	18	6	43	50.28	2.3143	21 23 58.0	5.229
19	4	51	18.61	2.4475	23 9	7.5	0.968	19	6	46	9.01	2.3100	21 18 40.8	5.343
20	4	53	45.43	2.4464	23 10	1.3	0.826	20	6	48	27.48	2.3057	21 13 16.8	5.457
21	4	56	12.18	2.4453	23 10	46.6	0.684	21	6	50	45.69	2.3013	21 7 46.0	5.570
22	4	58	38.86	2.4441	23 11	23.4	0.543	22	6	53	3.63	2.2968	21 2 8.4	5.682
23	5	1	5.47	2.4428	+23 11	51.7	+0.401	23	6	55	21.30	2.2923	+20 56 24.2	-5.793
AUGUST 2.							AUGUST 4.							
	h	m	s	s	"	"		h	m	s	s	"	"	
0	5	3	32.00	2.4414	+23 12	11.5	+0.259	0	6	57	38.70	2.2878	+20 50 33.3	-5.903
1	5	5	58.44	2.4399	23 12	22.8	+0.118	1	6	59	55.83	2.2832	20 44 35.8	6.013
2	5	8	24.79	2.4384	23 12	25.7	-0.023	2	7	2	12.68	2.2786	20 38 31.8	6.120
3	5	10	51.05	2.4368	23 12	20.1	0.163	3	7	4	29.26	2.2740	20 32 21.4	6.227
4	5	13	17.21	2.4351	23 12	6.1	0.304	4	7	6	45.56	2.2693	20 26 4.6	6.333
5	5	15	43.26	2.4333	23 11	43.6	0.444	5	7	9	1.58	2.2647	20 19 41.4	6.439
6	5	18	9.20	2.4314	23 11	12.8	0.583	6	7	11	17.32	2.2600	20 13 11.9	6.543
7	5	20	35.03	2.4294	23 10	33.6	0.723	7	7	13	32.78	2.2553	20 6 36.2	6.647
8	5	23	0.73	2.4273	23 9	46.1	0.861	8	7	15	47.95	2.2504	19 59 54.3	6.748
9	5	25	26.31	2.4253	23 8	50.3	1.000	9	7	18	2.83	2.2457	19 53 6.4	6.849
10	5	27	51.76	2.4231	23 7	46.1	1.138	10	7	20	17.43	2.2409	19 46 12.4	6.949
11	5	30	17.08	2.4208	23 6	33.7	1.275	11	7	22	31.74	2.2361	19 39 12.5	7.048
12	5	32	42.25	2.4183	23 5	13.1	1.412	12	7	24	45.76	2.2313	19 32 6.6	7.147
13	5	35	7.28	2.4159	23 3	44.3	1.549	13	7	26	59.49	2.2264	19 24 54.9	7.243
14	5	37	32.16	2.4133	23 2	7.2	1.686	14	7	29	12.93	2.2216	19 17 37.4	7.339
15	5	39	56.88	2.4107	23 0	22.0	1.821	15	7	31	26.08	2.2168	19 10 14.2	7.433
16	5	42	21.44	2.4080	22 58	28.7	1.956	16	7	33	38.94	2.2119	19 2 45.4	7.527
17	5	44	45.84	2.4053	22 56	27.3	2.090	17	7	35	51.51	2.2070	18 55 11.0	7.620
18	5	47	10.07	2.4024	22 54	17.9	2.224	18	7	38	3.78	2.2021	18 47 31.0	7.713
19	5	49	34.13	2.3995	22 52	0.4	2.358	19	7	40	15.76	2.1973	18 39 45.5	7.803
20	5	51	58.01	2.3965	22 49	34.9	2.491	20	7	42	27.45	2.1923	18 31 54.7	7.892
21	5	54	21.71	2.3934	22 47	1.5	2.623	21	7	44	38.84	2.1874	18 23 58.5	7.980
22	5	56	45.22	2.3903	22 44	20.1	2.755	22	7	46	49.94	2.1826	18 15 57.1	8.068
23	5	59	8.54	2.3870	22 41	30.9	2.885	23	7	49	0.75	2.1777	18 7 50.4	8.154
24	6	1	31.66	2.3838	+22 38	33.9	-3.015	24	7	51	11.26	2.1728	+17 59 38.6	-8.5

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 5.					AUGUST 7.				
	h m s	s	" ' "	"		h m s	s	" ' "	"
0	7 51 11.26	2.1728	+17 59 38.6	-8.239	0	9 30 8.33	1.9609	+10 6 8.4	-11.091
1	7 53 21.48	2.1678	17 51 21.7	8.323	1	9 32 5.88	1.9573	9 55 1.7	11.129
2	7 55 31.40	2.1629	17 42 59.8	8.406	2	9 34 3.21	1.9538	9 43 52.9	11.163
3	7 57 41.03	2.1581	17 34 33.0	8.488	3	9 36 0.34	1.9504	9 32 42.1	11.197
4	7 59 50.37	2.1533	17 26 1.2	8.569	4	9 37 57.26	1.9469	9 21 29.3	11.229
5	8 1 59.42	2.1483	17 17 24.7	8.649	5	9 39 53.97	1.9435	9 10 14.6	11.260
6	8 4 8.17	2.1434	17 8 43.3	8.728	6	9 41 50.48	1.9403	8 58 58.1	11.290
7	8 6 16.63	2.1386	16 59 57.3	8.806	7	9 43 46.80	1.9369	8 47 39.8	11.320
8	8 8 24.80	2.1338	16 51 6.6	8.883	8	9 45 42.91	1.9337	8 36 19.7	11.349
9	8 10 32.68	2.1289	16 42 11.4	8.958	9	9 47 38.84	1.9305	8 24 57.9	11.377
10	8 12 40.27	2.1242	16 33 11.6	9.033	10	9 49 34.57	1.9273	8 13 34.5	11.404
11	8 14 47.58	2.1193	16 24 7.5	9.106	11	9 51 30.11	1.9242	8 2 9.4	11.430
12	8 16 54.59	2.1145	16 14 58.9	9.178	12	9 53 25.47	1.9212	7 50 42.9	11.454
13	8 19 1.32	2.1098	16 5 46.1	9.249	13	9 55 20.65	1.9182	7 39 14.9	11.479
14	8 21 7.76	2.1050	15 56 29.0	9.320	14	9 57 15.65	1.9152	7 27 45.4	11.503
15	8 23 13.92	2.1003	15 47 7.7	9.388	15	9 59 10.47	1.9123	7 16 14.5	11.525
16	8 25 19.80	2.0956	15 37 42.4	9.456	16	10 1 5.12	1.9094	7 4 42.4	11.547
17	8 27 25.39	2.0908	15 28 13.0	9.524	17	10 2 59.60	1.9066	6 53 8.9	11.568
18	8 29 30.70	2.0863	15 18 39.5	9.590	18	10 4 53.91	1.9038	6 41 34.2	11.588
19	8 31 35.74	2.0816	15 9 2.2	9.654	19	10 6 48.06	1.9011	6 29 58.3	11.608
20	8 33 40.49	2.0769	14 59 21.0	9.718	20	10 8 42.04	1.8984	6 18 21.3	11.626
21	8 35 44.97	2.0724	14 49 36.0	9.782	21	10 10 35.87	1.8959	6 6 43.2	11.643
22	8 37 49.18	2.0678	14 39 47.2	9.843	22	10 12 29.55	1.8933	5 55 4.1	11.660
23	8 39 53.11	2.0633	+14 29 54.8	-9.904	23	10 14 23.07	1.8908	+5 43 24.0	-11.676
AUGUST 6.					AUGUST 8.				
	h m s	s	" ' "	"		h m s	s	" ' "	"
0	8 41 56.77	2.0588	+14 19 58.7	-9.964	0	10 16 16.44	1.8883	+5 31 43.0	-11.691
1	8 44 0.16	2.0543	14 9 59.1	10.023	1	10 18 9.67	1.8859	5 20 1.1	11.705
2	8 46 3.28	2.0498	13 59 56.0	10.080	2	10 20 2.75	1.8836	5 8 18.4	11.718
3	8 48 6.14	2.0455	13 49 49.5	10.136	3	10 21 55.70	1.8813	4 56 34.9	11.732
4	8 50 8.74	2.0410	13 39 39.7	10.192	4	10 23 48.51	1.8791	4 44 50.6	11.743
5	8 52 11.06	2.0366	13 29 26.5	10.247	5	10 25 41.19	1.8769	4 33 5.7	11.754
6	8 54 13.13	2.0324	13 19 10.1	10.300	6	10 27 33.74	1.8748	4 21 20.1	11.764
7	8 56 14.95	2.0281	13 8 50.5	10.353	7	10 29 26.16	1.8727	4 9 34.0	11.773
8	8 58 16.50	2.0238	12 58 27.7	10.404	8	10 31 18.46	1.8707	3 57 47.3	11.783
9	9 0 17.80	2.0196	12 48 2.0	10.454	9	10 33 10.64	1.8687	3 46 0.0	11.792
10	9 2 18.85	2.0154	12 37 33.2	10.505	10	10 35 2.70	1.8667	3 34 12.3	11.798
11	9 4 19.65	2.0113	12 27 1.4	10.553	11	10 36 54.64	1.8648	3 22 24.2	11.804
12	9 6 20.20	2.0072	12 16 26.8	10.600	12	10 38 46.48	1.8631	3 10 35.8	11.810
13	9 8 20.51	2.0031	12 5 49.4	10.647	13	10 40 38.21	1.8613	2 58 47.0	11.815
14	9 10 20.57	1.9990	11 55 9.2	10.693	14	10 42 29.83	1.8596	2 46 58.0	11.819
15	9 12 20.39	1.9950	11 44 26.3	10.737	15	10 44 21.36	1.8579	2 35 8.7	11.823
16	9 14 19.97	1.9910	11 33 40.8	10.780	16	10 46 12.78	1.8563	2 23 19.2	11.826
17	9 16 19.31	1.9871	11 22 52.7	10.823	17	10 48 4.11	1.8548	2 11 29.6	11.828
18	9 18 18.42	1.9833	11 12 2.1	10.864	18	10 49 55.35	1.8533	1 59 39.9	11.829
19	9 20 17.30	1.9795	11 1 9.0	10.905	19	10 51 46.50	1.8518	1 47 50.1	11.830
20	9 22 15.96	1.9757	10 50 13.5	10.945	20	10 53 37.57	1.8504	1 36 0.3	11.829
21	9 24 14.38	1.9719	10 39 15.6	10.984	21	10 55 28.55	1.8491	1 24 10.6	11.828
22	9 26 12.59	1.9683	10 28 15.4	11.022	22	10 57 19.46	1.8478	1 12 20.9	11.825
23	9 28 10.57	1.9645	10 17 13.0	11.058	23	10 59 10.29	1.8466	1 0 31.3	11.825
24	9 30 8.33	1.9609	+10 6 8.4	-11.094	24	11 1 1.05	1.8454	+0 48 41.9	-11.822

GREENWICH MEAN TIME.

ur.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.
AUGUST 9.							AUGUST 11.						
	h	m	s	s	"	"		h	m	s	s	"	"
0	11	1	1.05	1.8454	+0 48 41.9	-11.822	0	12 29 16.76	1.8528	- 8 22 32.3	-10.899		
1	11	2	51.74	1.8443	0 36 52.7	11.818	1	12 31 7.97	1.8543	8 33 25.2	10.804		
2	11	4	42.36	1.8432	0 25 3.8	11.813	2	12 32 59.27	1.8558	8 44 16.0	10.829		
3	11	6	32.92	1.8423	0 13 15.1	11.809	3	12 34 50.66	1.8573	8 55 4.7	10.793		
4	11	8	23.43	1.8413	+0 1 26.7	11.803	4	12 36 42.14	1.8588	9 5 51.2	10.757		
5	11	10	13.88	1.8403	-0 10 21.3	11.796	5	12 38 33.72	1.8605	9 16 35.5	10.719		
6	11	12	4.27	1.8395	0 22 8.8	11.788	6	12 40 25.40	1.8623	9 27 17.5	10.681		
7	11	13	54.62	1.8388	0 33 55.9	11.782	7	12 42 17.19	1.8641	9 37 57.2	10.643		
8	11	15	44.92	1.8380	0 45 42.6	11.773	8	12 44 9.09	1.8658	9 48 34.7	10.604		
9	11	17	35.18	1.8373	0 57 28.7	11.763	9	12 46 1.09	1.8677	9 59 9.7	10.564		
10	11	19	25.40	1.8368	1 9 14.2	11.753	10	12 47 53.21	1.8696	10 9 42.4	10.524		
11	11	21	15.59	1.8362	1 20 59.1	11.743	11	12 49 45.44	1.8715	10 20 12.6	10.483		
12	11	23	5.74	1.8356	1 32 43.3	11.732	12	12 51 37.79	1.8735	10 30 40.3	10.441		
13	11	24	55.86	1.8352	1 44 26.9	11.720	13	12 53 30.26	1.8756	10 41 5.5	10.398		
14	11	26	45.96	1.8348	1 56 9.7	11.707	14	12 55 22.86	1.8777	10 51 28.1	10.356		
15	11	28	36.03	1.8343	2 7 51.7	11.694	15	12 57 15.58	1.8798	11 1 48.2	10.313		
16	11	30	26.08	1.8341	2 19 33.0	11.680	16	12 59 8.43	1.8820	11 12 5.6	10.268		
17	11	32	16.12	1.8339	2 31 13.3	11.665	17	13 1 1.42	1.8843	11 22 20.4	10.224		
18	11	34	6.15	1.8337	2 42 52.8	11.651	18	13 2 54.54	1.8865	11 32 32.5	10.178		
19	11	35	56.16	1.8335	2 54 31.4	11.635	19	13 4 47.80	1.8889	11 42 41.8	10.132		
20	11	37	46.17	1.8334	3 6 9.0	11.618	20	13 6 41.21	1.8913	11 52 48.3	10.085		
21	11	39	36.17	1.8334	3 17 45.5	11.601	21	13 8 34.75	1.8937	12 2 52.0	10.038		
22	11	41	26.18	1.8335	3 29 21.1	11.583	22	13 10 28.45	1.8962	12 12 52.9	9.991		
23	11	43	16.19	1.8335	-3 40 55.5	-11.564	23	13 12 22.29	1.8987	-12 22 50.9	-9.942		
AUGUST 10.							AUGUST 12.						
	h	m	s	s	"	"		h	m	s	s	"	"
0	11	45	6.20	1.8336	-3 52 28.8	-11.546	0	13 14 16.29	1.9013	-12 32 45.9	-9.893		
1	11	46	56.22	1.8338	4 4 1.0	11.526	1	13 16 10.44	1.9038	12 42 38.0	9.843		
2	11	48	46.26	1.8341	4 15 31.9	11.505	2	13 18 4.75	1.9065	12 52 27.0	9.792		
3	11	50	36.31	1.8343	4 27 1.6	11.485	3	13 19 59.22	1.9092	13 2 13.0	9.741		
4	11	52	26.38	1.8348	4 38 30.1	11.463	4	13 21 53.85	1.9119	13 11 55.9	9.689		
5	11	54	16.48	1.8352	4 49 57.2	11.441	5	13 23 48.65	1.9148	13 21 35.7	9.637		
6	11	56	6.60	1.8356	5 1 23.0	11.418	6	13 25 43.62	1.9176	13 31 12.3	9.583		
7	11	57	56.75	1.8361	5 12 47.3	11.394	7	13 27 38.76	1.9204	13 40 45.7	9.530		
8	11	59	46.93	1.8366	5 24 10.3	11.371	8	13 29 34.07	1.9233	13 50 15.9	9.476		
9	12	1	37.14	1.8372	5 35 31.8	11.346	9	13 31 29.56	1.9263	13 59 42.8	9.420		
10	12	3	27.39	1.8379	5 46 51.8	11.320	10	13 33 25.23	1.9293	14 9 6.3	9.364		
11	12	5	17.69	1.8387	5 58 10.2	11.293	11	13 35 21.08	1.9323	14 18 26.5	9.308		
12	12	7	8.03	1.8394	6 9 27.0	11.267	12	13 37 17.11	1.9354	14 27 43.3	9.251		
13	12	8	58.42	1.8403	6 20 42.2	11.240	13	13 39 13.33	1.9386	14 36 56.6	9.193		
14	12	10	48.86	1.8411	6 31 55.8	11.212	14	13 41 9.74	1.9418	14 46 6.5	9.135		
15	12	12	39.35	1.8420	6 43 7.6	11.183	15	13 43 6.34	1.9449	14 55 12.8	9.075		
16	12	14	29.90	1.8431	6 54 17.8	11.155	16	13 45 3.13	1.9482	15 4 15.5	9.016		
17	12	16	20.52	1.8441	7 5 26.2	11.124	17	13 47 0.12	1.9514	15 13 14.7	8.956		
18	12	18	11.19	1.8451	7 16 32.7	11.094	18	13 48 57.30	1.9548	15 22 10.2	8.894		
19	12	20	1.93	1.8463	7 27 37.5	11.064	19	13 50 54.69	1.9582	15 31 2.0	8.833		
20	12	21	52.75	1.8475	7 38 40.4	11.032	20	13 52 52.28	1.9615	15 39 50.1	8.770		
21	12	23	43.63	1.8487	7 49 41.3	10.999	21	13 54 50.07	1.9648	15 48 34.4	8.707		
22	12	25	34.59	1.8501	8 0 40.3	10.967	22	13 56 48.06	1.9683	15 57 14.9	8.643		
23	12	27	25.64	1.8514	8 11 37.3	10.933	23	13 58 46.27	1.9719	16 5 51.5	8.578		
24	12	29	16.76	1.8528	-8 22 32.3	-10.899	24	14 0 44.69	1.9754	-16 14 24.2	-8.510		

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 13.					AUGUST 15.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 0 44.69	1.9754	-16 14 24.2	-8.513	0	15 40 6.83	2.1706	-21 33 58.0	-4.516
1	14 2 43.32	1.9790	16 22 53.0	8.447	1	15 42 17.19	2.1748	21 38 25.9	4.415
2	14 4 42.17	1.9826	16 31 17.8	8.379	2	15 44 27.81	2.1790	21 42 47.8	4.313
3	14 6 41.23	1.9862	16 39 38.5	8.312	3	15 46 38.67	2.1832	21 47 3.4	4.209
4	14 8 40.51	1.9899	16 47 55.2	8.244	4	15 48 49.79	2.1874	21 51 12.9	4.106
5	14 10 40.02	1.9936	16 56 7.8	8.175	5	15 51 1.16	2.1915	21 55 16.1	4.001
6	14 12 39.74	1.9973	17 4 16.2	8.106	6	15 53 12.77	2.1957	21 59 13.0	3.896
7	14 14 39.69	2.0011	17 12 20.5	8.036	7	15 55 24.64	2.1998	22 3 3.5	3.789
8	14 16 39.87	2.0048	17 20 20.5	7.964	8	15 57 36.75	2.2039	22 6 47.7	3.683
9	14 18 40.27	2.0087	17 28 16.2	7.893	9	15 59 49.11	2.2081	22 10 25.4	3.575
10	14 20 40.91	2.0125	17 36 7.6	7.821	10	16 2 1.72	2.2122	22 13 56.7	3.468
11	14 22 41.77	2.0163	17 43 54.7	7.748	11	16 4 14.57	2.2162	22 17 21.5	3.358
12	14 24 42.87	2.0203	17 51 37.3	7.673	12	16 6 27.66	2.2202	22 20 39.7	3.248
13	14 26 44.20	2.0242	17 59 15.5	7.598	13	16 8 40.99	2.2242	22 23 51.3	3.138
14	14 28 45.77	2.0281	18 6 49.1	7.523	14	16 10 54.56	2.2282	22 26 56.3	3.027
15	14 30 47.57	2.0320	18 14 18.2	7.448	15	16 13 8.37	2.2321	22 29 54.5	2.915
16	14 32 49.61	2.0361	18 21 42.8	7.371	16	16 15 22.41	2.2360	22 32 46.1	2.803
17	14 34 51.90	2.0401	18 29 2.7	7.293	17	16 17 36.69	2.2399	22 35 30.9	2.690
18	14 36 54.42	2.0441	18 36 17.9	7.214	18	16 19 51.20	2.2438	22 38 8.9	2.576
19	14 38 57.19	2.0483	18 43 28.4	7.135	19	16 22 5.94	2.2476	22 40 40.0	2.461
20	14 41 0.21	2.0523	18 50 34.1	7.056	20	16 24 20.91	2.2514	22 43 4.2	2.346
21	14 43 3.46	2.0563	18 57 35.1	6.976	21	16 26 36.11	2.2552	22 45 21.5	2.231
22	14 45 6.97	2.0605	19 4 31.2	6.894	22	16 28 51.53	2.2589	22 47 31.9	2.114
23	14 47 10.72	2.0646	-19 11 22.4	-6.812	23	16 31 7.18	2.2626	-22 49 35.2	-1.997
AUGUST 14.					AUGUST 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 49 14.72	2.0688	-19 18 8.6	-6.729	0	16 33 23.04	2.2662	-22 51 31.5	-1.879
1	14 51 18.97	2.0729	19 24 49.9	6.646	1	16 35 39.12	2.2698	22 53 20.7	1.761
2	14 53 23.47	2.0771	19 31 26.1	6.562	2	16 37 55.42	2.2734	22 55 2.8	1.642
3	14 55 28.22	2.0813	19 37 57.3	6.477	3	16 40 11.93	2.2769	22 56 37.7	1.522
4	14 57 33.22	2.0855	19 44 23.3	6.391	4	16 42 28.65	2.2804	22 58 5.4	1.402
5	14 59 38.48	2.0898	19 50 44.2	6.304	5	16 44 45.58	2.2838	22 59 25.9	1.281
6	15 1 43.99	2.0939	19 56 59.8	6.217	6	16 47 2.71	2.2873	23 0 39.1	1.159
7	15 3 49.75	2.0981	20 3 10.2	6.129	7	16 49 20.05	2.2907	23 1 45.0	1.038
8	15 5 55.76	2.1024	20 9 15.3	6.040	8	16 51 37.59	2.2939	23 2 43.6	0.916
9	15 8 2.04	2.1068	20 15 15.0	5.951	9	16 53 55.32	2.2972	23 3 34.9	0.798
10	15 10 8.57	2.1109	20 21 9.4	5.861	10	16 56 13.25	2.3004	23 4 18.7	0.668
11	15 12 15.35	2.1152	20 26 58.3	5.769	11	16 58 31.37	2.3036	23 4 55.1	0.544
12	15 14 22.39	2.1195	20 32 41.7	5.678	12	17 0 49.68	2.3067	23 5 24.0	0.419
13	15 16 29.69	2.1238	20 38 19.6	5.585	13	17 3 8.17	2.3098	23 5 45.4	0.294
14	15 18 37.24	2.1279	20 43 51.9	5.492	14	17 5 26.85	2.3128	23 5 59.3	0.169
15	15 20 45.04	2.1323	20 49 18.6	5.398	15	17 7 45.70	2.3157	23 6 5.7	-0.043
16	15 22 53.11	2.1366	20 54 39.6	5.303	16	17 10 4.73	2.3186	23 6 4.4	+0.084
17	15 25 1.43	2.1408	20 59 54.9	5.207	17	17 12 23.93	2.3214	23 5 55.6	0.211
18	15 27 10.00	2.1451	21 5 4.4	5.110	18	17 14 43.30	2.3242	23 5 39.1	0.339
19	15 29 18.84	2.1494	21 10 8.1	5.013	19	17 17 2.83	2.3269	23 5 14.9	0.467
20	15 31 27.93	2.1536	21 15 6.0	4.915	20	17 19 22.53	2.3297	23 4 43.1	0.595
21	15 33 37.27	2.1578	21 19 57.9	4.816	21	17 21 42.39	2.3323	23 4 3.5	0.724
22	15 35 46.87	2.1621	21 24 43.9	4.718	22	17 24 2.40	2.3348	23 3 16.2	0.853
23	15 37 56.72	2.1663	21 29 24.0	4.618	23	17 26 22.56	2.3373	23 2 21.1	0.983
24	15 40 6.83	2.1706	-21 33 58.0	-4.516	24	17 28 42.87	2.3398	-23 1 18.2	+1.113

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 17.					AUGUST 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 28 42.87	2.3398	-23 1 18.2	+1.113	0	19 22 37.90	2.3831	-19 34 57.2	+7.460
1	17 31 3.33	2.3421	23 0 7.5	1.243	1	19 25 0.96	2.3825	19 27 25.8	7.588
2	17 33 23.92	2.3444	22 58 49.0	1.374	2	19 27 23.89	2.3819	19 19 46.7	7.714
3	17 35 44.66	2.3467	22 57 22.6	1.506	3	19 29 46.79	2.3813	19 12 0.1	7.839
4	17 38 5.52	2.3488	22 55 48.3	1.637	4	19 32 9.65	2.3807	19 4 6.0	7.963
5	17 40 26.52	2.3510	22 54 6.2	1.768	5	19 34 32.47	2.3800	18 56 4.5	8.088
6	17 42 47.64	2.3531	22 52 16.1	1.901	6	19 36 55.25	2.3793	18 47 55.4	8.213
7	17 45 8.89	2.3551	22 50 18.1	2.033	7	19 39 17.98	2.3784	18 39 39.0	8.335
8	17 47 30.25	2.3570	22 48 12.2	2.165	8	19 41 40.66	2.3776	18 31 15.2	8.458
9	17 49 51.73	2.3589	22 45 58.3	2.298	9	19 44 3.29	2.3768	18 22 44.1	8.579
10	17 52 13.32	2.3608	22 43 36.5	2.431	10	19 46 25.87	2.3758	18 14 5.7	8.700
11	17 54 35.02	2.3625	22 41 6.6	2.564	11	19 48 48.39	2.3748	18 5 20.1	8.820
12	17 56 56.82	2.3642	22 38 28.8	2.697	12	19 51 10.85	2.3739	17 56 27.3	8.939
13	17 59 18.72	2.3658	22 35 43.0	2.831	13	19 53 33.26	2.3729	17 47 27.4	9.058
14	18 1 40.72	2.3673	22 32 49.1	2.964	14	19 55 55.60	2.3718	17 38 20.3	9.177
15	18 4 2.80	2.3688	22 29 47.3	3.098	15	19 58 17.88	2.3708	17 29 6.2	9.293
16	18 6 24.98	2.3703	22 26 37.4	3.232	16	20 0 40.10	2.3697	17 19 45.1	9.409
17	18 8 47.23	2.3716	22 23 19.5	3.366	17	20 3 2.24	2.3685	17 10 17.1	9.524
18	18 11 9.57	2.3730	22 19 53.5	3.500	18	20 5 24.32	2.3674	17 0 42.2	9.639
19	18 13 31.99	2.3742	22 16 19.5	3.634	19	20 7 46.33	2.3663	16 51 0.4	9.753
20	18 15 54.47	2.3753	22 12 37.4	3.768	20	20 10 8.27	2.3650	16 41 11.9	9.865
21	18 18 17.03	2.3765	22 8 47.3	3.902	21	20 12 30.13	2.3638	16 31 16.6	9.977
22	18 20 39.65	2.3775	22 4 49.2	4.036	22	20 14 51.92	2.3626	16 21 14.7	10.088
23	18 23 2.33	2.3784	-22 0 43.0	+4.171	23	20 17 13.64	2.3613	-16 11 6.1	+10.198
AUGUST 18.					AUGUST 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 25 25.06	2.3793	-21 56 28.7	+4.305	0	20 19 35.27	2.3599	-16 0 51.0	+10.306
1	18 27 47.85	2.3802	21 52 6.4	4.439	1	20 21 56.83	2.3587	15 50 29.4	10.414
2	18 30 10.68	2.3809	21 47 36.0	4.573	2	20 24 18.31	2.3573	15 40 1.3	10.521
3	18 32 33.56	2.3817	21 42 57.7	4.706	3	20 26 39.70	2.3559	15 29 26.9	10.627
4	18 34 56.48	2.3823	21 38 11.3	4.841	4	20 29 1.02	2.3546	15 18 46.1	10.731
5	18 37 19.44	2.3829	21 33 16.8	4.975	5	20 31 22.25	2.3532	15 7 59.2	10.834
6	18 39 42.43	2.3834	21 28 14.3	5.108	6	20 33 43.40	2.3518	14 57 6.0	10.937
7	18 42 5.45	2.3839	21 23 3.9	5.241	7	20 36 4.47	2.3504	14 46 6.7	11.038
8	18 44 28.50	2.3843	21 17 45.4	5.374	8	20 38 25.45	2.3490	14 35 1.4	11.139
9	18 46 51.57	2.3847	21 12 19.0	5.507	9	20 40 46.35	2.3476	14 23 50.0	11.238
10	18 49 14.66	2.3850	21 6 44.6	5.639	10	20 43 7.16	2.3462	14 12 32.8	11.336
11	18 51 37.77	2.3853	21 1 2.3	5.772	11	20 45 27.89	2.3448	14 1 9.7	11.433
12	18 54 0.89	2.3854	20 55 12.0	5.904	12	20 47 48.53	2.3433	13 49 40.9	11.528
13	18 56 24.02	2.3855	20 49 13.8	6.036	13	20 50 9.09	2.3419	13 38 6.4	11.623
14	18 58 47.15	2.3855	20 43 7.7	6.167	14	20 52 29.56	2.3404	13 26 26.2	11.716
15	19 1 10.28	2.3855	20 36 53.8	6.298	15	20 54 49.94	2.3390	13 14 40.5	11.808
16	19 3 33.41	2.3854	20 30 31.9	6.430	16	20 57 10.24	2.3376	13 2 49.3	11.898
17	19 5 56.53	2.3853	20 24 2.2	6.559	17	20 59 30.45	2.3361	12 50 52.7	11.988
18	19 8 19.65	2.3852	20 17 24.8	6.689	18	21 1 50.57	2.3347	12 38 50.8	12.076
19	19 10 42.75	2.3849	20 10 39.5	6.819	19	21 4 10.61	2.3333	12 26 43.6	12.163
20	19 13 5.84	2.3847	20 3 46.5	6.948	20	21 6 30.56	2.3318	12 14 31.3	12.248
21	19 15 28.91	2.3843	19 56 45.7	7.078	21	21 8 50.43	2.3305	12 2 13.8	12.333
22	19 17 51.96	2.3840	19 49 37.2	7.206	22	21 11 10.22	2.3290	11 49 51.4	12.415
23	19 20 14.99	2.3836	19 42 21.0	7.333	23	21 13 29.91	2.3276	11 37 24.0	12.497
24	19 22 37.99	2.3831	-19 34 57.2	+7.460	24	21 15 49.53	2.3263	-11 24 51.8	+12.577

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.
AUGUST 21.					AUGUST 23.			
0	h m s	s	° ' "	"	0	h m s	s	° ' "
0	21 15 49.53	2.3263	-11 24 51.8	+12.577	0	23 6 20.32	2.2911	- 0 17 25.8
1	21 18 9.07	2.3249	11 12 14.8	12.655	1	23 8 37.79	2.2913	- 0 2 48.6
2	21 20 28.52	2.3235	10 59 33.2	12.732	2	23 10 55.28	2.2916	+ 0 11 48.6
3	21 22 47.89	2.3222	10 46 47.0	12.808	3	23 13 12.78	2.2918	0 26 25.9
4	21 25 7.18	2.3209	10 33 56.2	12.883	4	23 15 30.30	2.2922	0 41 3.0
5	21 27 26.40	2.3196	10 21 1.0	12.956	5	23 17 47.84	2.2926	0 55 39.8
6	21 29 45.53	2.3183	10 8 1.5	13.028	6	23 20 5.41	2.2930	1 10 16.4
7	21 32 4.59	2.3171	9 54 57.7	13.098	7	23 22 23.00	2.2934	1 24 52.5
8	21 34 23.58	2.3158	9 41 49.8	13.167	8	23 24 40.62	2.2939	1 39 28.1
9	21 36 42.48	2.3145	9 28 37.7	13.234	9	23 26 58.27	2.2944	1 54 3.0
10	21 39 1.32	2.3133	9 15 21.7	13.299	10	23 29 15.95	2.2951	2 8 37.2
11	21 41 20.08	2.3121	9 2 1.8	13.363	11	23 31 33.68	2.2958	2 23 10.6
12	21 43 38.77	2.3109	8 48 38.1	13.427	12	23 33 51.44	2.2963	2 37 43.0
13	21 45 57.39	2.3098	8 35 10.6	13.488	13	23 36 9.24	2.2971	2 52 14.4
14	21 48 15.95	2.3087	8 21 39.5	13.548	14	23 38 27.09	2.2979	3 6 44.6
15	21 50 34.43	2.3076	8 8 4.9	13.605	15	23 40 44.99	2.2988	3 21 13.5
16	21 52 52.86	2.3066	7 54 26.9	13.663	16	23 43 2.94	2.2996	3 35 41.1
17	21 55 11.22	2.3055	7 40 45.4	13.718	17	23 45 20.94	2.3004	3 50 7.3
18	21 57 29.52	2.3045	7 27 0.7	13.771	18	23 47 38.99	2.3014	4 4 31.9
19	21 59 47.76	2.3035	7 13 12.9	13.823	19	23 49 57.11	2.3024	4 18 54.9
20	22 2 5.94	2.3026	6 59 21.9	13.874	20	23 52 15.28	2.3034	4 33 16.1
21	22 4 24.07	2.3018	6 45 28.0	13.923	21	23 54 33.52	2.3046	4 47 35.5
22	22 6 42.15	2.3008	6 31 31.2	13.969	22	23 56 51.82	2.3056	5 1 52.9
23	22 9 0.17	2.2999	- 6 17 31.7	+14.015	23	23 59 10.19	2.3068	+ 5 16 8.3
AUGUST 22.					AUGUST 24.			
0	22 11 18.14	2.2991	- 6 3 29.4	+14.059	0	0 1 28.63	2.3079	+ 5 30 21.5
1	22 13 36.06	2.2983	5 49 24.6	14.102	1	0 3 47.14	2.3092	5 44 32.4
2	22 15 53.94	2.2977	5 35 17.2	14.143	2	0 6 5.73	2.3104	5 58 41.0
3	22 18 11.78	2.2969	5 21 7.5	14.181	3	0 8 24.39	2.3118	6 12 47.2
4	22 20 29.57	2.2962	5 6 55.5	14.218	4	0 10 43.14	2.3132	6 26 50.8
5	22 22 47.32	2.2956	4 52 41.3	14.255	5	0 13 1.97	2.3145	6 40 51.8
6	22 25 5.04	2.2950	4 38 24.9	14.289	6	0 15 20.88	2.3159	6 54 50.0
7	22 27 22.72	2.2944	4 24 6.6	14.321	7	0 17 39.88	2.3174	7 8 45.4
8	22 29 40.37	2.2939	4 9 46.4	14.353	8	0 19 58.97	2.3189	7 22 37.8
9	22 31 57.99	2.2934	3 55 24.3	14.382	9	0 22 18.15	2.3204	7 36 27.3
10	22 34 15.58	2.2930	3 41 0.6	14.409	10	0 24 37.42	2.3220	7 50 13.6
11	22 36 33.15	2.2926	3 26 35.2	14.435	11	0 26 56.79	2.3236	8 3 56.6
12	22 38 50.69	2.2922	3 12 8.4	14.458	12	0 29 16.25	2.3252	8 17 36.4
13	22 41 8.21	2.2919	2 57 40.2	14.482	13	0 31 35.81	2.3269	8 31 12.7
14	22 43 25.72	2.2917	2 43 10.6	14.503	14	0 33 55.48	2.3287	8 44 45.5
15	22 45 43.21	2.2913	2 28 39.9	14.522	15	0 36 15.25	2.3303	8 58 14.7
16	22 48 0.68	2.2912	2 14 8.0	14.539	16	0 38 35.12	2.3322	9 11 40.3
17	22 50 18.15	2.2910	1 59 35.2	14.554	17	0 40 55.11	2.3340	9 25 2.0
18	22 52 35.60	2.2908	* 1 45 1.5	14.569	18	0 43 15.20	2.3358	9 38 19.8
19	22 54 53.05	2.2908	1 30 26.9	14.582	19	0 45 35.40	2.3376	9 51 33.7
20	22 57 10.50	2.2908	1 15 51.7	14.593	20	0 47 55.71	2.3395	10 4 43.5
21	22 59 27.95	2.2908	1 1 15.8	14.602	21	0 50 16.14	2.3414	10 17 49.2
22	23 1 45.40	2.2909	0 46 39.5	14.608	22	0 52 36.68	2.3433	10 30 50.6
23	23 4 2.86	2.2910	0 32 2.8	14.614	23	0 54 57.34	2.3453	10 43 47.7
	23 6 20.32	2.2911	- 0 17 25.8	+14.618	24	0 57 18.12	2.3473	+10 56 40.3

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 25.					AUGUST 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	0 57 18.12	2.3473	+10 56 40.3	+12.840	0	2 52 24.19	2.4451	+19 22 3.7	+7.775
1	0 59 39.02	2.3493	11 9 28.5	12.764	1	2 54 50.94	2.4466	19 29 46.3	7.645
2	1 2 0.04	2.3513	11 22 12.0	12.686	2	2 57 17.78	2.4481	19 37 21.1	7.514
3	1 4 21.18	2.3533	11 34 50.8	12.608	3	2 59 44.71	2.4496	19 44 48.0	7.383
4	1 6 42.44	2.3554	11 47 24.9	12.528	4	3 2 11.73	2.4509	19 52 7.0	7.250
5	1 9 3.83	2.3575	11 59 54.1	12.446	5	3 4 38.82	2.4523	19 59 18.0	7.117
6	1 11 25.34	2.3596	12 12 18.4	12.363	6	3 7 6.00	2.4536	20 6 21.0	6.983
7	1 13 46.98	2.3617	12 24 37.7	12.278	7	3 9 33.25	2.4548	20 13 16.0	6.849
8	1 16 8.74	2.3638	12 36 51.8	12.193	8	3 12 0.57	2.4558	20 20 2.9	6.714
9	1 18 30.64	2.3660	12 49 0.8	12.106	9	3 14 27.95	2.4570	20 26 41.7	6.578
10	1 20 52.66	2.3682	13 1 4.5	12.017	10	3 16 55.41	2.4582	20 33 12.3	6.442
11	1 23 14.82	2.3703	13 13 2.8	11.927	11	3 19 22.93	2.4591	20 39 34.7	6.305
12	1 25 37.10	2.3724	13 24 55.7	11.836	12	3 21 50.50	2.4600	20 45 48.9	6.168
13	1 27 59.51	2.3747	13 36 43.1	11.743	13	3 24 18.13	2.4609	20 51 54.8	6.030
14	1 30 22.06	2.3768	13 48 24.9	11.649	14	3 26 45.81	2.4618	20 57 52.5	5.892
15	1 32 44.73	2.3790	14 0 1.0	11.553	15	3 29 13.54	2.4625	21 3 41.8	5.753
16	1 35 7.54	2.3813	14 11 31.3	11.457	16	3 31 41.31	2.4632	21 9 22.9	5.614
17	1 37 30.48	2.3834	14 22 55.8	11.359	17	3 34 9.12	2.4638	21 14 55.5	5.474
18	1 39 53.55	2.3856	14 34 14.4	11.260	18	3 36 36.96	2.4643	21 20 19.8	5.335
19	1 42 16.75	2.3878	14 45 27.0	11.160	19	3 39 4.84	2.4649	21 25 35.7	5.194
20	1 44 40.08	2.3900	14 56 33.6	11.058	20	3 41 32.75	2.4653	21 30 43.1	5.054
21	1 47 3.55	2.3923	15 7 34.0	10.956	21	3 44 0.68	2.4656	21 35 42.2	4.913
22	1 49 27.15	2.3944	15 18 28.3	10.852	22	3 46 28.62	2.4659	21 40 32.7	4.771
23	1 51 50.88	2.3966	+15 29 16.2	+10.746	23	3 48 56.59	2.4662	+21 45 14.7	+4.630
AUGUST 26.					AUGUST 28.				
0	1 54 14.74	2.3988	+15 39 57.8	+10.640	0	3 51 24.56	2.4663	+21 49 48.3	+4.488
1	1 56 38.73	2.4010	15 50 33.0	10.532	1	3 53 52.54	2.4664	21 54 13.3	4.347
2	1 59 2.86	2.4032	16 1 1.6	10.423	2	3 56 20.53	2.4664	21 58 29.9	4.204
3	2 1 27.11	2.4053	16 11 23.7	10.313	3	3 58 48.51	2.4663	22 2 37.8	4.061
4	2 3 51.49	2.4074	16 21 39.2	10.203	4	4 1 16.49	2.4662	22 6 37.2	3.919
5	2 6 16.00	2.4095	16 31 48.0	10.091	5	4 3 44.45	2.4659	22 10 28.1	3.776
6	2 8 40.63	2.4116	16 41 50.1	9.978	6	4 6 12.40	2.4657	22 14 10.3	3.633
7	2 11 5.39	2.4138	16 51 45.4	9.863	7	4 8 40.33	2.4653	22 17 44.0	3.490
8	2 13 30.28	2.4158	17 1 33.7	9.748	8	4 11 8.24	2.4648	22 21 9.1	3.347
9	2 15 55.29	2.4178	17 11 15.1	9.632	9	4 13 36.11	2.4643	22 24 25.6	3.204
10	2 18 20.42	2.4199	17 20 49.5	9.515	10	4 16 3.96	2.4638	22 27 33.6	3.061
11	2 20 45.68	2.4219	17 30 16.9	9.397	11	4 18 31.76	2.4630	22 30 32.9	2.917
12	2 23 11.05	2.4238	17 39 37.1	9.277	12	4 20 59.52	2.4623	22 33 23.6	2.773
13	2 25 36.54	2.4258	17 48 50.1	9.157	13	4 23 27.23	2.4614	22 36 5.7	2.631
14	2 28 2.15	2.4278	17 57 55.9	9.036	14	4 25 54.89	2.4605	22 38 39.3	2.488
15	2 30 27.87	2.4297	18 6 54.4	8.914	15	4 28 22.49	2.4596	22 41 4.2	2.343
16	2 32 53.71	2.4315	18 15 45.6	8.791	16	4 30 50.04	2.4585	22 43 20.5	2.201
17	2 35 19.65	2.4333	18 24 29.3	8.667	17	4 33 17.51	2.4573	22 45 28.3	2.058
18	2 37 45.71	2.4352	18 33 5.6	8.542	18	4 35 44.91	2.4561	22 47 27.5	1.915
19	2 40 11.87	2.4368	18 41 34.3	8.416	19	4 38 12.24	2.4548	22 49 18.1	1.772
20	2 42 38.13	2.4386	18 49 55.5	8.290	20	4 40 39.49	2.4534	22 51 0.1	1.629
21	2 45 4.50	2.4403	18 58 9.1	8.163	21	4 43 6.65	2.4519	22 52 33.6	1.487
22	2 47 30.97	2.4419	19 6 15.0	8.035	22	4 45 33.72	2.4503	22 53 58.5	1.344
23	2 49 57.53	2.4435	19 14 13.3	7.906	23	4 48 0.69	2.4488	22 55 14.9	1.203
24	2 52 24.19	2.4451	+19 22 3.7	+7.775	24	4 50 27.57	2.4471	+22 56 22.8	+1.060

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.		
AUGUST 29.							AUGUST 31.								
	h	m	s	s	"	"		h	m	s	s	"	"		
0	4	50	27.57	2.4471	+22 56	22.8	+1.061	0	6	44	37.41	2.2873	+21 12	45.7	-5
1	4	52	54.34	2.4453	22 57	22.2	0.919	1	6	46	54.51	2.2828	21 7	34.6	5
2	4	55	21.00	2.4434	22 58	13.1	0.778	2	6	49	11.34	2.2783	21 2	16.9	5
3	4	57	47.55	2.4415	22 58	55.5	0.637	3	6	51	27.90	2.2737	20 56	52.6	5
4	5	0	13.98	2.4395	22 59	29.5	0.497	4	6	53	44.18	2.2691	20 51	21.8	5
5	5	2	40.29	2.4374	22 59	55.1	0.357	5	6	56	0.19	2.2644	20 45	44.6	5
6	5	5	6.47	2.4353	23 0	12.3	0.217	6	6	58	15.91	2.2598	20 40	1.0	5
7	5	7	32.52	2.4331	23 0	21.1	+0.077	7	7	0	31.36	2.2552	20 34	11.0	5
8	5	9	58.44	2.4308	23 0	21.5	-0.063	8	7	2	46.53	2.2505	20 28	14.8	5
9	5	12	24.21	2.4283	23 0	13.6	0.201	9	7	5	1.42	2.2458	20 22	12.4	6
10	5	14	49.83	2.4258	22 59	57.4	0.339	10	7	7	16.03	2.2412	20 16	3.8	6
11	5	17	15.31	2.4233	22 59	32.9	0.478	11	7	9	30.36	2.2364	20 9	49.1	6
12	5	19	40.63	2.4207	22 59	0.1	0.615	12	7	11	44.40	2.2317	20 3	28.3	6
13	5	22	5.79	2.4180	22 58	19.1	0.752	13	7	13	58.16	2.2269	19 57	1.6	6
14	5	24	30.79	2.4153	22 57	29.9	0.888	14	7	16	11.63	2.2222	19 50	28.9	6
15	5	26	55.63	2.4125	22 56	32.6	1.023	15	7	18	24.82	2.2174	19 43	50.3	6
16	5	29	20.29	2.4095	22 55	27.1	1.159	16	7	20	37.72	2.2127	19 37	6.0	6
17	5	31	44.77	2.4066	22 54	13.5	1.294	17	7	22	50.34	2.2079	19 30	15.8	6
18	5	34	9.08	2.4036	22 52	51.8	1.428	18	7	25	2.67	2.2031	19 23	20.0	6
19	5	36	33.20	2.4005	22 51	22.1	1.563	19	7	27	14.71	2.1983	19 16	18.5	7
20	5	38	57.14	2.3974	22 49	44.3	1.696	20	7	29	26.46	2.1935	19 9	11.4	7
21	5	41	20.89	2.3942	22 47	58.6	1.828	21	7	31	37.93	2.1888	19 1	58.8	7
22	5	43	44.44	2.3908	22 46	5.0	1.959	22	7	33	49.11	2.1839	18 54	40.8	7
23	5	46	7.79	2.3875	+22 44	3.5	-2.091	23	7	36	0.00	2.1792	+18 47	17.3	-7
AUGUST 30.							SEPTEMBER 1.								
	h	m	s	s	"	"		h	m	s	s	"	"		
0	5	48	30.94	2.3841	+22 41	54.1	-2.222	0	7	38	10.61	2.1744	+18 39	48.5	-7
1	5	50	53.88	2.3806	22 39	36.9	2.352	1	7	40	20.93	2.1696	18 32	14.4	7
2	5	53	16.61	2.3771	22 37	11.9	2.481	2	7	42	30.96	2.1648	18 24	35.1	7
3	5	55	39.13	2.3735	22 34	39.2	2.609	3	7	44	40.71	2.1601	18 16	50.7	7
4	5	58	1.43	2.3699	22 31	58.8	2.737	4	7	46	50.17	2.1553	18 9	1.1	7
5	6	0	23.52	2.3663	22 29	10.8	2.864	5	7	48	59.35	2.1507	18 1	6.5	7
6	6	2	45.38	2.3624	22 26	15.1	2.991	6	7	51	8.25	2.1459	17 53	6.9	8
7	6	5	7.01	2.3586	22 23	11.9	3.116	7	7	53	16.86	2.1411	17 45	2.3	8
8	6	7	28.41	2.3548	22 20	1.2	3.241	8	7	55	25.18	2.1364	17 36	52.9	8
9	6	9	49.58	2.3509	22 16	43.0	3.366	9	7	57	33.23	2.1318	17 28	38.7	8
10	6	12	10.52	2.3470	22 13	17.3	3.489	10	7	59	40.99	2.1270	17 20	19.7	8
11	6	14	31.22	2.3429	22 9	44.3	3.612	11	8	1	48.47	2.1223	17 11	56.0	8
12	6	16	51.67	2.3388	22 6	3.9	3.733	12	8	3	55.67	2.1177	17 3	27.7	8
13	6	19	11.88	2.3348	22 2	16.3	3.854	13	8	6	2.59	2.1131	16 54	54.8	8
14	6	21	31.85	2.3307	21 58	21.4	3.975	14	8	8	9.24	2.1085	16 46	17.5	8
15	6	23	51.56	2.3265	21 54	19.3	4.094	15	8	10	15.61	2.1038	16 37	35.6	8
16	6	26	11.03	2.3223	21 50	10.1	4.213	16	8	12	21.70	2.0993	16 28	49.4	8
17	6	28	30.24	2.3180	21 45	53.8	4.330	17	8	14	27.52	2.0948	16 19	58.8	8
18	6	30	49.19	2.3138	21 41	30.5	4.447	18	8	16	33.07	2.0902	16 11	4.0	8
19	6	33	7.89	2.3094	21 37	0.2	4.563	19	8	18	38.34	2.0857	16 2	4.9	8
20	6	35	26.32	2.3050	21 32	22.9	4.678	20	8	20	43.35	2.0813	15 53	1.7	8
21	6	37	44.49	2.3007	21 27	38.8	4.792	21	8	22	48.19	2.0768	15 43	54.4	8
22	6	40	2.40	2.2963	21 22	47.9	4.906	22	8	24	52.56	2.0723	15 34	43.0	8
23	6	42	20.04	2.2918	21 17	50.1	5.018	23	8	26	56.76	2.0678	15 25	27.6	8
	6	44	37.41	2.2873	+21 12	45.7	-5.129	24	8	29	0.70	2.0635	+15 16	8.3	-4

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 2.					SEPTEMBER 4.				
	h m s		" "	" "		h m s		" "	" "
0	8 29 0.70	2.0635	+15 16 8.3	-9.353	0	10 3 39.86	1.8961	+6 50 2.9	-11.391
1	8 31 4.38	2.0591	15 6 45.2	-9.418	1	10 5 33.55	1.8937	6 38 38.8	11.413
2	8 33 7.79	2.0548	14 57 18.2	-9.481	2	10 7 27.10	1.8913	6 27 13.4	11.433
3	8 35 10.95	2.0505	14 47 47.5	-9.543	3	10 9 20.51	1.8890	6 15 46.9	11.453
4	8 37 13.85	2.0462	14 38 13.1	-9.603	4	10 11 13.78	1.8867	6 4 19.1	11.472
5	8 39 16.49	2.0419	14 28 35.1	-9.663	5	10 13 6.91	1.8844	5 52 50.3	11.489
6	8 41 18.88	2.0378	14 18 53.5	-9.723	6	10 14 59.91	1.8823	5 41 20.4	11.507
7	8 43 21.02	2.0336	14 9 8.3	-9.782	7	10 16 52.79	1.8802	5 29 49.5	11.523
8	8 45 22.91	2.0294	13 59 19.7	-9.838	8	10 18 45.53	1.8781	5 18 17.6	11.539
9	8 47 24.55	2.0253	13 49 27.7	-9.895	9	10 20 38.16	1.8761	5 6 44.8	11.553
10	8 49 25.94	2.0212	13 39 32.3	-9.951	10	10 22 30.66	1.8741	4 55 11.2	11.568
11	8 51 27.09	2.0172	13 29 33.6	-10.005	11	10 24 23.05	1.8722	4 43 36.7	11.582
12	8 53 28.00	2.0132	13 19 31.7	-10.058	12	10 26 15.32	1.8703	4 32 1.4	11.594
13	8 55 28.67	2.0092	13 9 26.6	-10.111	13	10 28 7.48	1.8684	4 20 25.4	11.606
14	8 57 29.10	2.0053	12 59 18.4	-10.163	14	10 29 59.53	1.8667	4 8 48.7	11.618
15	8 59 29.30	2.0013	12 49 7.1	-10.213	15	10 31 51.48	1.8650	3 57 11.3	11.628
16	9 1 29.26	1.9975	12 38 52.8	-10.263	16	10 33 43.33	1.8633	3 45 33.3	11.638
17	9 3 29.00	1.9937	12 28 35.5	-10.313	17	10 35 35.07	1.8616	3 33 54.8	11.646
18	9 5 28.50	1.9898	12 18 15.3	-10.361	18	10 37 26.72	1.8600	3 22 15.8	11.654
19	9 7 27.78	1.9862	12 7 52.2	-10.408	19	10 39 18.27	1.8584	3 10 36.3	11.662
20	9 9 26.84	1.9824	11 57 26.4	-10.453	20	10 41 9.73	1.8570	2 58 56.4	11.668
21	9 11 25.67	1.9788	11 46 57.8	-10.498	21	10 43 1.11	1.8556	2 47 16.1	11.673
22	9 13 24.29	1.9752	11 36 26.6	-10.543	22	10 44 52.40	1.8541	2 35 35.6	11.678
23	9 15 22.69	1.9715	+11 25 52.7	-10.587	23	10 46 43.60	1.8528	+2 23 54.7	-11.683
SEPTEMBER 3.					SEPTEMBER 5.				
	h m s		" "	" "		h m s		" "	" "
0	9 17 20.87	1.9679	+11 15 16.2	-10.629	0	10 48 34.73	1.8516	+2 12 13.6	-11.687
1	9 19 18.84	1.9645	11 4 37.2	-10.671	1	10 50 25.79	1.8503	2 0 32.3	11.689
2	9 21 16.61	1.9611	10 53 55.7	-10.712	2	10 52 16.77	1.8491	1 48 50.9	11.692
3	9 23 14.17	1.9576	10 43 11.8	-10.751	3	10 54 7.68	1.8479	1 37 9.3	11.693
4	9 25 11.52	1.9543	10 32 25.6	-10.790	4	10 55 58.52	1.8468	1 25 27.7	11.693
5	9 27 8.68	1.9509	10 21 37.0	-10.828	5	10 57 49.30	1.8458	1 13 46.1	11.693
6	9 29 5.63	1.9476	10 10 46.2	-10.866	6	10 59 40.02	1.8448	1 2 4.5	11.693
7	9 31 2.39	1.9443	9 59 53.1	-10.903	7	11 1 30.68	1.8439	0 50 23.0	11.691
8	9 32 58.95	1.9412	9 48 57.9	-10.938	8	11 3 21.29	1.8430	0 38 41.6	11.688
9	9 34 55.33	1.9380	9 38 0.6	-10.973	9	11 5 11.84	1.8422	0 27 0.4	11.686
10	9 36 51.51	1.9348	9 27 1.2	-11.007	10	11 7 2.35	1.8414	0 15 19.3	11.683
11	9 38 47.51	1.9318	9 15 59.8	-11.039	11	11 8 52.81	1.8406	+0 3 38.5	11.678
12	9 40 43.33	1.9288	9 4 56.5	-11.071	12	11 10 43.22	1.8399	-0 8 2.0	11.673
13	9 42 38.97	1.9258	8 53 51.3	-11.103	13	11 12 33.60	1.8393	0 19 42.2	11.667
14	9 44 34.42	1.9228	8 42 44.2	-11.133	14	11 14 23.93	1.8387	0 31 22.0	11.660
15	9 46 29.71	1.9200	8 31 35.4	-11.162	15	11 16 14.24	1.8382	0 43 1.4	11.653
16	9 48 24.82	1.9171	8 20 24.8	-11.191	16	11 18 4.51	1.8376	0 54 40.4	11.646
17	9 50 19.76	1.9143	8 9 12.5	-11.219	17	11 19 54.75	1.8372	1 6 18.9	11.637
18	9 52 14.54	1.9116	7 57 58.5	-11.247	18	11 21 44.97	1.8368	1 17 56.8	11.628
19	9 54 9.15	1.9088	7 46 42.9	-11.273	19	11 23 35.17	1.8365	1 29 34.2	11.618
20	9 56 3.60	1.9063	7 35 25.8	-11.298	20	11 25 25.35	1.8362	1 41 11.0	11.607
21	9 57 57.90	1.9037	7 24 7.2	-11.322	21	11 27 15.51	1.8358	1 52 47.0	11.595
22	9 59 52.04	1.9010	7 12 47.2	-11.346	22	11 29 5.65	1.8357	2 4 22.4	11.584
23	10 1 46.02	1.8985	7 1 25.7	-11.369	23	11 30 55.79	1.8356	2 15 57.1	11.571
24	10 3 39.86	1.8961	+ 6 50 2.9	-11.391	24	11 32 45.92	1.8354	-2 27 30.9	-11.551

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 6.					SEPTEMBER 8.				
	h m s	s	" "	" "		h m s	s	" "	" "
0	11 32 45.92	1.8354	- 2 27 30.9	-11.557	0	13 1 38.18	1.8848	-11 14 2.4	-10.128
1	11 34 36.04	1.8353	2 39 3.9	11.543	1	13 3 31.33	1.8868	11 24 8.7	10.082
2	11 36 26.16	1.8354	2 50 36.1	11.528	2	13 5 24.60	1.8890	11 34 12.2	10.084
3	11 38 16.29	1.8354	3 2 7.3	11.513	3	13 7 18.01	1.8912	11 44 12.8	9.987
4	11 40 6.41	1.8354	3 13 37.6	11.497	4	13 9 11.54	1.8933	11 54 10.6	9.940
5	11 41 56.54	1.8357	3 25 6.9	11.480	5	13 11 5.21	1.8957	12 4 5.6	9.892
6	11 43 46.69	1.8358	3 36 35.2	11.463	6	13 12 59.02	1.8979	12 13 57.6	9.843
7	11 45 36.84	1.8360	3 48 2.4	11.444	7	13 14 52.96	1.9002	12 23 46.6	9.792
8	11 47 27.01	1.8363	3 59 28.5	11.425	8	13 16 47.04	1.9026	12 33 32.6	9.743
9	11 49 17.20	1.8367	4 10 53.4	11.406	9	13 18 41.27	1.9050	12 43 15.6	9.691
10	11 51 7.41	1.8370	4 22 17.2	11.386	10	13 20 35.64	1.9073	12 52 55.5	9.638
11	11 52 57.64	1.8374	4 33 39.7	11.364	11	13 22 30.15	1.9098	13 2 32.2	9.586
12	11 54 47.90	1.8379	4 45 0.9	11.343	12	13 24 24.82	1.9124	13 12 5.8	9.533
13	11 56 38.19	1.8384	4 56 20.8	11.321	13	13 26 19.64	1.9149	13 21 36.2	9.479
14	11 58 28.51	1.8390	5 7 39.4	11.298	14	13 28 14.61	1.9174	13 31 3.3	9.425
15	12 0 18.87	1.8396	5 18 56.6	11.274	15	13 30 9.73	1.9201	13 40 27.2	9.370
16	12 2 9.26	1.8403	5 30 12.3	11.250	16	13 32 5.02	1.9228	13 49 47.7	9.313
17	12 3 59.70	1.8410	5 41 26.6	11.226	17	13 34 0.46	1.9253	13 59 4.8	9.258
18	12 5 50.18	1.8417	5 52 39.4	11.200	18	13 35 56.06	1.9281	14 8 18.6	9.201
19	12 7 40.70	1.8425	6 3 50.6	11.173	19	13 37 51.83	1.9308	14 17 28.9	9.143
20	12 9 31.28	1.8433	6 15 0.2	11.147	20	13 39 47.76	1.9335	14 26 35.7	9.084
21	12 11 21.90	1.8442	6 26 8.2	11.120	21	13 41 43.85	1.9363	14 35 39.0	9.025
22	12 13 12.58	1.8452	6 37 14.6	11.092	22	13 43 40.12	1.9392	14 44 38.7	8.965
23	12 15 3.32	1.8462	- 6 48 19.2	-11.062	23	13 45 36.55	1.9420	-14 53 34.8	-8.905
SEPTEMBER 7.					SEPTEMBER 9.				
	h m s	s	" "	" "		h m s	s	" "	" "
0	12 16 54.12	1.8472	- 6 59 22.0	-11.033	0	13 47 33.16	1.9449	-15 2 27.3	-8.844
1	12 18 44.98	1.8483	7 10 23.1	11.003	1	13 49 29.94	1.9478	15 11 16.1	8.783
2	12 20 35.91	1.8493	7 21 22.3	10.971	2	13 51 26.90	1.9508	15 20 1.2	8.720
3	12 22 26.90	1.8504	7 32 19.6	10.940	3	13 53 24.04	1.9538	15 28 42.5	8.657
4	12 24 17.96	1.8517	7 43 15.1	10.908	4	13 55 21.36	1.9568	15 37 20.0	8.593
5	12 26 9.10	1.8530	7 54 8.6	10.875	5	13 57 18.85	1.9598	15 45 53.7	8.529
6	12 28 0.32	1.8543	8 5 0.1	10.841	6	13 59 16.54	1.9629	15 54 23.5	8.463
7	12 29 51.61	1.8556	8 15 49.5	10.807	7	14 1 14.40	1.9659	16 2 49.3	8.398
8	12 31 42.99	1.8570	8 26 36.9	10.773	8	14 3 12.45	1.9691	16 11 11.2	8.332
9	12 33 34.45	1.8583	8 37 22.2	10.738	9	14 5 10.69	1.9722	16 19 29.1	8.264
10	12 35 25.99	1.8598	8 48 5.4	10.702	10	14 7 9.11	1.9753	16 27 42.9	8.197
11	12 37 17.63	1.8614	8 58 46.4	10.664	11	14 9 7.73	1.9786	16 35 52.7	8.128
12	12 39 9.36	1.8629	9 9 25.1	10.627	12	14 11 6.54	1.9818	16 43 58.3	8.059
13	12 41 1.18	1.8645	9 20 1.6	10.589	13	14 13 5.54	1.9850	16 51 59.8	7.989
14	12 42 53.10	1.8662	9 30 35.8	10.550	14	14 15 4.74	1.9883	16 59 57.0	7.918
15	12 44 45.12	1.8678	9 41 7.6	10.511	15	14 17 4.13	1.9915	17 7 50.0	7.846
16	12 46 37.24	1.8696	9 51 37.1	10.471	16	14 19 3.72	1.9948	17 15 38.7	7.776
17	12 48 29.47	1.8713	10 2 4.1	10.430	17	14 21 3.51	1.9982	17 23 23.1	7.704
18	12 50 21.80	1.8732	10 12 28.7	10.389	18	14 23 3.50	2.0016	17 31 3.2	7.631
19	12 52 14.25	1.8750	10 22 50.8	10.348	19	14 25 3.70	2.0049	17 38 38.8	7.557
20	12 54 6.80	1.8768	10 33 10.4	10.304	20	14 27 4.09	2.0082	17 46 10.0	7.483
21	12 55 59.47	1.8788	10 43 27.3	10.261	21	14 29 4.68	2.0116	17 53 36.6	7.407
22	12 57 52.25	1.8808	10 53 41.7	10.218	22	14 31 5.48	2.0151	18 0 58.8	7.332
23	12 59 45.16	1.8828	11 3 53.4	10.173	23	14 33 6.49	2.0185	18 8 16.4	7.254
24	13 1 38.18	1.8848	-11 14 2.4	-10.128	24	14 35 7.70	2.0219	-18 15 29.3	-7.177

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 10.					SEPTEMBER 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	14 35 7.70	2.0219	-18 15 29.3	-7.177	0	16 16 15.80	2.1903	-22 18 29.9	-2.701
1	14 37 9.12	2.0253	18 22 37.6	7.099	1	16 18 27.32	2.1936	22 21 8.7	2.593
2	14 39 10.74	2.0288	18 29 41.2	7.021	2	16 20 39.03	2.1968	22 23 41.0	2.484
3	14 41 12.58	2.0324	18 36 40.1	6.942	3	16 22 50.93	2.2000	22 26 6.8	2.375
4	14 43 14.63	2.0358	18 43 34.2	6.862	4	16 25 3.03	2.2032	22 28 26.0	2.265
5	14 45 16.88	2.0393	18 50 23.5	6.782	5	16 27 15.31	2.2062	22 30 38.6	2.154
6	14 47 19.35	2.0429	18 57 8.0	6.700	6	16 29 27.77	2.2093	22 32 44.5	2.043
7	14 49 22.03	2.0464	19 3 47.5	6.618	7	16 31 40.42	2.2124	22 34 43.7	1.931
8	14 51 24.92	2.0499	19 10 22.1	6.536	8	16 33 53.26	2.2154	22 36 36.2	1.819
9	14 53 28.02	2.0535	19 16 51.8	6.453	9	16 36 6.27	2.2183	22 38 22.0	1.707
10	14 55 31.34	2.0571	19 23 16.4	6.368	10	16 38 19.46	2.2213	22 40 1.0	1.593
11	14 57 34.87	2.0607	19 29 36.0	6.284	11	16 40 32.83	2.2243	22 41 33.2	1.480
12	14 59 38.62	2.0643	19 35 50.5	6.199	12	16 42 46.37	2.2272	22 42 58.6	1.366
13	15 1 42.58	2.0678	19 41 59.9	6.113	13	16 45 0.09	2.2301	22 44 17.1	1.251
14	15 3 46.76	2.0714	19 48 4.0	6.026	14	16 47 13.98	2.2328	22 45 28.7	1.136
15	15 5 51.15	2.0749	19 54 3.0	5.939	15	16 49 28.03	2.2356	22 46 33.4	1.020
16	15 7 55.75	2.0785	19 59 56.7	5.852	16	16 51 42.25	2.2384	22 47 31.1	0.903
17	15 10 0.57	2.0822	20 5 45.2	5.763	17	16 53 56.64	2.2412	22 48 21.8	0.788
18	15 12 5.61	2.0858	20 11 28.3	5.673	18	16 56 11.19	2.2438	22 49 5.6	0.671
19	15 14 10.87	2.0894	20 17 6.0	5.583	19	16 58 25.89	2.2464	22 49 42.3	0.553
20	15 16 16.34	2.0930	20 22 38.3	5.493	20	17 0 40.76	2.2491	22 50 11.9	0.435
21	15 18 22.03	2.0966	20 28 5.2	5.403	21	17 2 55.78	2.2516	22 50 34.5	0.318
22	15 20 27.93	2.1002	20 33 26.6	5.310	22	17 5 10.95	2.2541	22 50 50.0	0.199
23	15 22 34.05	2.1038	-20 38 42.4	-5.218	23	17 7 26.27	2.2566	-22 50 58.4	-0.080
SEPTEMBER 11.					SEPTEMBER 13.				
0	15 24 40.39	2.1074	-20 43 52.7	-5.125	0	17 9 41.74	2.2591	-22 50 59.6	+0.040
1	15 26 46.94	2.1110	20 48 57.4	5.031	1	17 11 57.36	2.2614	22 50 53.6	0.159
2	15 28 53.71	2.1146	20 53 56.4	4.937	2	17 14 13.11	2.2638	22 50 40.5	0.279
3	15 31 0.69	2.1182	20 58 49.8	4.842	3	17 16 29.01	2.2662	22 50 20.1	0.400
4	15 33 7.89	2.1218	21 3 37.4	4.745	4	17 18 45.05	2.2684	22 49 52.5	0.521
5	15 35 15.30	2.1253	21 8 19.2	4.649	5	17 21 1.22	2.2706	22 49 17.6	0.643
6	15 37 22.92	2.1288	21 12 55.3	4.553	6	17 23 17.52	2.2728	22 48 35.4	0.763
7	15 39 30.76	2.1324	21 17 25.5	4.455	7	17 25 33.95	2.2749	22 47 46.0	0.885
8	15 41 38.81	2.1359	21 21 49.9	4.357	8	17 27 50.51	2.2770	22 46 49.2	1.008
9	15 43 47.07	2.1394	21 26 8.3	4.258	9	17 30 7.19	2.2790	22 45 45.1	1.130
10	15 45 55.54	2.1429	21 30 20.8	4.158	10	17 32 23.99	2.2810	22 44 33.6	1.253
11	15 48 4.22	2.1464	21 34 27.3	4.058	11	17 34 40.91	2.2830	22 43 14.7	1.376
12	15 50 13.11	2.1499	21 38 27.7	3.957	12	17 36 57.95	2.2849	22 41 48.5	1.498
13	15 52 22.21	2.1534	21 42 22.1	3.856	13	17 39 15.10	2.2868	22 40 14.9	1.623
14	15 54 31.52	2.1569	21 46 10.4	3.754	14	17 41 32.36	2.2886	22 38 33.8	1.747
15	15 56 41.04	2.1603	21 49 52.6	3.652	15	17 43 49.73	2.2904	22 36 45.3	1.870
16	15 58 50.76	2.1637	21 53 28.6	3.548	16	17 46 7.21	2.2921	22 34 49.4	1.993
17	16 1 0.68	2.1671	21 56 58.3	3.444	17	17 48 24.78	2.2938	22 32 46.1	2.118
18	16 3 10.81	2.1706	22 0 21.9	3.340	18	17 50 42.46	2.2954	22 30 35.2	2.243
19	16 5 21.15	2.1739	22 3 39.1	3.234	19	17 53 0.23	2.2969	22 28 16.9	2.368
20	16 7 31.68	2.1773	22 6 50.0	3.129	20	17 55 18.09	2.2985	22 25 51.1	2.493
21	16 9 42.41	2.1806	22 9 54.6	3.023	21	17 57 36.05	2.3000	22 23 17.8	2.618
22	16 11 53.35	2.1839	22 12 52.8	2.917	22	17 59 54.09	2.3014	22 20 36.9	2.743
23	16 14 4.48	2.1871	22 15 44.6	2.809	23	18 2 12.22	2.3028	22 17 48.6	2.868
24	16 16 15.80	2.1903	-22 18 29.9	-2.701	24	18 4 30.43	2.3042	-22 14 52.7	+2.904

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 14.					SEPTEMBER 16.				
	h m s	s	" "	"		h m s	s	" "	"
0	18 4 30.43	2.3042	-22 14 52.7	+2.994	0	19 55 50.64	2.3209	-17 27 45.0	+ 8.875
1	18 6 48.72	2.3055	22 11 49.3	3.120	1	19 58 9.88	2.3205	17 18 49.1	8.988
2	18 9 7.09	2.3068	22 8 38.3	3.245	2	20 0 29.10	2.3202	17 9 46.4	9.101
3	18 11 25.53	2.3079	22 5 19.9	3.371	3	20 2 48.30	2.3198	17 0 37.0	9.213
4	18 13 44.04	2.3091	22 1 53.8	3.498	4	20 5 7.47	2.3193	16 51 20.9	9.324
5	18 16 2.62	2.3103	21 58 20.2	3.623	5	20 7 26.61	2.3188	16 41 58.1	9.435
6	18 18 21.27	2.3113	21 54 39.1	3.748	6	20 9 45.73	2.3184	16 32 28.7	9.545
7	18 20 39.98	2.3123	21 50 50.4	3.875	7	20 12 4.82	2.3179	16 22 52.7	9.654
8	18 22 58.75	2.3133	21 46 54.1	4.001	8	20 14 23.88	2.3174	16 13 10.2	9.762
9	18 25 17.57	2.3143	21 42 50.3	4.127	9	20 16 42.91	2.3169	16 3 21.3	9.869
10	18 27 36.46	2.3152	21 38 38.9	4.253	10	20 19 1.91	2.3164	15 53 25.9	9.977
11	18 29 55.39	2.3159	21 34 20.0	4.378	11	20 21 20.88	2.3159	15 43 24.1	10.083
12	18 32 14.37	2.3168	21 29 53.5	4.504	12	20 23 39.82	2.3154	15 33 15.9	10.189
13	18 34 33.40	2.3175	21 25 19.5	4.630	13	20 25 58.73	2.3149	15 23 1.4	10.293
14	18 36 52.47	2.3183	21 20 37.9	4.756	14	20 28 17.61	2.3144	15 12 40.7	10.397
15	18 39 11.59	2.3189	21 15 48.8	4.882	15	20 30 36.46	2.3139	15 2 13.8	10.499
16	18 41 30.74	2.3194	21 10 52.1	5.008	16	20 32 55.28	2.3134	14 51 40.8	10.602
17	18 43 49.92	2.3200	21 5 47.9	5.133	17	20 35 14.07	2.3128	14 41 1.6	10.703
18	18 46 9.14	2.3207	21 0 36.2	5.258	18	20 37 32.82	2.3123	14 30 16.4	10.803
19	18 48 28.40	2.3212	20 55 17.0	5.383	19	20 39 51.55	2.3118	14 19 25.3	10.901
20	18 50 47.68	2.3216	20 49 50.3	5.508	20	20 42 10.24	2.3113	14 8 28.3	11.000
21	18 53 6.99	2.3220	20 44 16.1	5.633	21	20 44 28.91	2.3108	13 57 25.3	11.098
22	18 55 26.32	2.3224	20 38 34.4	5.757	22	20 46 47.54	2.3103	13 46 16.6	11.193
23	18 57 45.68	2.3228	-20 32 45.3	+5.881	23	20 49 6.15	2.3098	-13 35 2.1	+11.289
SEPTEMBER 15.					SEPTEMBER 17.				
	h m s	s	" "	"		h m s	s	" "	"
0	19 0 5.05	2.3230	-20 26 48.7	+6.005	0	20 51 24.72	2.3093	-13 23 41.9	+11.388
1	19 2 24.44	2.3233	20 20 44.7	6.129	1	20 53 43.27	2.3088	13 12 16.1	11.477
2	19 4 43.85	2.3236	20 14 33.2	6.253	2	20 56 1.78	2.3083	13 0 44.7	11.569
3	19 7 3.27	2.3238	20 8 14.3	6.376	3	20 58 20.27	2.3080	12 49 7.8	11.660
4	19 9 22.70	2.3239	20 1 48.1	6.499	4	21 0 38.74	2.3075	12 37 25.5	11.751
5	19 11 42.14	2.3240	19 55 14.4	6.623	5	21 2 57.17	2.3070	12 25 37.7	11.840
6	19 14 1.58	2.3241	19 48 33.4	6.744	6	21 5 15.58	2.3067	12 13 44.7	11.928
7	19 16 21.03	2.3242	19 41 45.1	6.866	7	21 7 33.97	2.3063	12 1 46.4	12.015
8	19 18 40.48	2.3242	19 34 49.5	6.988	8	21 9 52.33	2.3058	11 49 42.9	12.101
9	19 20 59.93	2.3243	19 27 46.5	7.110	9	21 12 10.66	2.3054	11 37 34.3	12.185
10	19 23 19.39	2.3243	19 20 36.3	7.230	10	21 14 28.98	2.3051	11 25 20.7	12.268
11	19 25 38.84	2.3241	19 13 18.9	7.351	11	21 16 47.27	2.3047	11 13 2.1	12.351
12	19 27 58.28	2.3240	19 5 54.2	7.472	12	21 19 5.54	2.3043	11 0 38.6	12.432
13	19 30 17.72	2.3239	18 58 22.3	7.591	13	21 21 23.79	2.3041	10 48 10.3	12.512
14	19 32 37.15	2.3237	18 50 43.3	7.709	14	21 23 42.03	2.3038	10 35 37.2	12.591
15	19 34 56.56	2.3235	18 42 57.2	7.829	15	21 26 0.25	2.3035	10 22 59.4	12.668
16	19 37 15.97	2.3233	18 35 3.8	7.948	16	21 28 18.45	2.3033	10 10 17.0	12.744
17	19 39 35.36	2.3231	18 27 3.4	8.066	17	21 30 36.64	2.3031	9 57 30.1	12.819
18	19 41 54.74	2.3229	18 18 55.9	8.183	18	21 32 54.82	2.3028	9 44 38.7	12.893
19	19 44 14.11	2.3226	18 10 41.5	8.299	19	21 35 12.98	2.3027	9 31 42.9	12.966
20	19 46 33.45	2.3223	18 2 20.0	8.416	20	21 37 31.14	2.3025	9 18 42.8	13.037
21	19 48 52.78	2.3220	17 53 51.6	8.531	21	21 39 49.28	2.3023	9 5 38.5	13.106
22	19 51 12.09	2.3216	17 45 16.3	8.646	22	21 42 7.42	2.3023	8 52 30.1	13.174
23	19 53 31.37	2.3213	17 36 34.1	8.761	23	21 44 25.56	2.3023	8 39 17.6	13.242
24	19 55 50.64	2.3209	-17 27 45.0	+8.875	24	21 46 43.69	2.3022	- 8 26 1.1	+13.308

GREENWICH MEAN TIME.

Light anion.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 18.				SEPTEMBER 20.				
n s	s	" ' "	" "	h m s	s	" ' "	" "	
5 43.69	2.3022	-8 26 1.1	+13.308	0	23 37 50.37	2.3424	+ 2 59 19.8	+14.609
9 1.82	2.3022	8 12 40.7	13.372	1	23 40 10.97	2.3443	3 13 55.9	14.593
1 19.95	2.3021	7 59 16.5	13.434	2	23 42 31.68	2.3461	3 28 31.0	14.577
3 38.07	2.3022	7 45 48.6	13.495	3	23 44 52.50	2.3480	3 43 5.1	14.558
5 56.21	2.3023	7 32 17.1	13.556	4	23 47 13.44	2.3499	3 57 37.9	14.537
3 14.35	2.3023	7 18 41.9	13.615	5	23 49 34.49	2.3519	4 12 9.5	14.514
0 32.49	2.3025	7 5 3.3	13.672	6	23 51 55.67	2.3539	4 26 39.6	14.489
2 50.65	2.3027	6 51 21.3	13.728	7	23 54 16.96	2.3559	4 41 8.2	14.463
5 8.81	2.3028	6 37 36.0	13.782	8	23 56 38.38	2.3580	4 55 35.1	14.433
7 26.99	2.3032	6 23 47.5	13.834	9	23 58 59.92	2.3601	5 10 0.2	14.403
9 45.19	2.3034	6 9 55.9	13.886	10	0 1 21.59	2.3622	5 24 23.5	14.372
2 3.40	2.3037	5 56 1.2	13.936	11	0 3 43.38	2.3643	5 38 44.9	14.338
4 21.63	2.3040	5 42 3.6	13.983	12	0 6 5.31	2.3666	5 53 4.1	14.302
5 39.88	2.3044	5 28 3.2	14.030	13	0 8 27.37	2.3688	6 7 21.1	14.264
3 58.16	2.3048	5 14 0.0	14.076	14	0 10 49.57	2.3711	6 21 35.8	14.225
1 16.46	2.3053	4 59 54.1	14.119	15	0 13 11.90	2.3734	6 35 48.1	14.183
3 34.79	2.3058	4 45 45.7	14.161	16	0 15 34.38	2.3758	6 49 57.8	14.140
5 53.15	2.3063	4 31 34.8	14.201	17	0 17 56.99	2.3780	7 4 4.9	14.096
3 11.55	2.3069	4 17 21.6	14.240	18	0 20 19.74	2.3804	7 18 9.3	14.048
0 29.98	2.3074	4 3 6.0	14.278	19	0 22 42.64	2.3829	7 32 10.7	13.999
2 48.44	2.3081	3 48 48.3	14.313	20	0 25 5.69	2.3853	7 46 9.2	13.949
5 6.95	2.3088	3 34 28.5	14.347	21	0 27 28.88	2.3878	8 0 4.6	13.897
7 25.49	2.3094	3 20 6.7	14.379	22	0 29 52.22	2.3902	8 13 56.8	13.843
9 44.08	2.3103	-3 5 43.0	+14.410	23	0 32 15.70	2.3927	+ 8 27 45.7	+13.787
SEPTEMBER 19.				SEPTEMBER 21.				
2 2.72	2.3111	-2 51 17.5	+14.438	0	0 34 39.34	2.3953	+ 8 41 31.2	+13.728
4 21.41	2.3119	2 36 50.4	14.465	1	0 37 3.13	2.3978	8 55 13.1	13.668
6 40.15	2.3128	2 22 21.7	14.491	2	0 39 27.08	2.4004	9 8 51.4	13.608
8 58.94	2.3137	2 7 51.5	14.515	3	0 41 51.18	2.4029	9 22 26.0	13.544
1 17.79	2.3146	1 53 19.9	14.538	4	0 44 15.43	2.4055	9 35 56.7	13.479
3 36.69	2.3156	1 38 47.0	14.558	5	0 46 39.84	2.4082	9 49 23.5	13.413
5 55.66	2.3167	1 24 13.0	14.576	6	0 49 4.41	2.4108	10 2 46.2	13.343
8 14.69	2.3178	1 9 37.9	14.593	7	0 51 29.14	2.4135	10 16 4.7	13.273
0 33.79	2.3189	0 55 1.8	14.608	8	0 53 54.03	2.4162	10 29 18.9	13.201
2 52.96	2.3200	0 40 24.9	14.622	9	0 56 19.08	2.4188	10 42 28.8	13.128
5 12.19	2.3212	0 25 47.2	14.633	10	0 58 44.28	2.4214	10 55 34.2	13.052
7 31.50	2.3225	-0 11 8.9	14.643	11	1 1 9.65	2.4242	11 8 35.0	12.974
9 50.89	2.3238	+0 3 30.0	14.652	12	1 3 35.18	2.4268	11 21 31.1	12.895
2 10.36	2.3251	0 18 9.3	14.658	13	1 6 0.87	2.4296	11 34 22.4	12.814
4 29.90	2.3264	0 32 49.0	14.663	14	1 8 26.73	2.4323	11 47 8.8	12.731
6 49.53	2.3279	0 47 28.8	14.665	15	1 10 52.75	2.4350	11 59 50.1	12.647
9 9.25	2.3293	1 2 8.8	14.667	16	1 13 18.93	2.4377	12 12 26.4	12.562
11 29.05	2.3308	1 16 48.8	14.666	17	1 15 45.27	2.4404	12 24 57.5	12.474
13 48.95	2.3324	1 31 28.7	14.663	18	1 18 11.78	2.4432	12 37 23.3	12.385
16 8.94	2.3339	1 46 8.4	14.658	19	1 20 38.45	2.4458	12 49 43.7	12.294
18 29.02	2.3356	2 0 47.7	14.653	20	1 23 5.28	2.4486	13 1 58.6	12.202
10 49.21	2.3373	2 15 26.7	14.645	21	1 25 32.28	2.4513	13 14 7.9	12.108
13 9.49	2.3389	2 30 5.1	14.634	22	1 27 59.43	2.4539	13 26 11.6	12.013
15 29.88	2.3407	2 44 42.8	14.623	23	1 30 26.75	2.4567	13 38 9.4	11.915
17 50.37	2.3424	+2 59 19.8	+14.609	24	1 32 54.23	2.4593	+13 50 1.4	+11.817

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 22.					SEPTEMBER 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 32 54.23	2.4593	+13 50 1.4	+11.817	0	3 33 25.00	2.5418	+20 58 33.1	+5.644
1	1 35 21.87	2.4620	14 1 47.4	11.716	1	3 35 57.51	2.5418	21 4 7.3	5.496
2	1 37 49.67	2.4647	14 13 27.3	11.614	2	3 38 30.02	2.5418	21 9 32.6	5.347
3	1 40 17.63	2.4673	14 25 1.1	11.511	3	3 41 2.53	2.5418	21 14 48.9	5.198
4	1 42 45.74	2.4698	14 36 28.6	11.406	4	3 43 35.04	2.5418	21 19 56.3	5.048
5	1 45 14.01	2.4724	14 47 49.8	11.300	5	3 46 7.54	2.5415	21 24 54.6	4.898
6	1 47 42.43	2.4750	14 59 4.6	11.192	6	3 48 40.02	2.5412	21 29 44.0	4.748
7	1 50 11.01	2.4777	15 10 12.8	11.083	7	3 51 12.48	2.5408	21 34 24.4	4.598
8	1 52 39.75	2.4802	15 21 14.5	10.973	8	3 53 44.91	2.5403	21 38 55.7	4.447
9	1 55 8.63	2.4826	15 32 9.5	10.861	9	3 56 17.31	2.5397	21 43 18.0	4.297
10	1 57 37.66	2.4851	15 42 57.8	10.748	10	3 58 49.67	2.5389	21 47 31.3	4.146
11	2 0 6.84	2.4875	15 53 39.2	10.633	11	4 1 21.98	2.5382	21 51 35.5	3.995
12	2 2 36.16	2.4899	16 4 13.7	10.517	12	4 3 54.25	2.5373	21 55 30.7	3.844
13	2 5 5.63	2.4923	16 14 41.2	10.399	13	4 6 26.46	2.5363	21 59 16.8	3.693
14	2 7 35.24	2.4947	16 25 1.6	10.280	14	4 8 58.61	2.5353	22 2 53.8	3.542
15	2 10 4.99	2.4969	16 35 14.8	10.160	15	4 11 30.70	2.5342	22 6 21.8	3.391
16	2 12 34.87	2.4993	16 45 20.8	10.039	16	4 14 2.71	2.5329	22 9 40.7	3.240
17	2 15 4.90	2.5015	16 55 19.5	9.917	17	4 16 34.65	2.5316	22 12 50.6	3.089
18	2 17 35.05	2.5036	17 5 10.8	9.793	18	4 19 6.50	2.5302	22 15 51.4	2.938
19	2 20 5.33	2.5058	17 14 54.7	9.668	19	4 21 38.27	2.5287	22 18 43.2	2.788
20	2 22 35.74	2.5079	17 24 31.0	9.542	20	4 24 9.94	2.5270	22 21 25.9	2.636
21	2 25 6.28	2.5099	17 33 59.7	9.415	21	4 26 41.51	2.5253	22 23 59.5	2.486
22	2 27 36.93	2.5119	17 43 20.8	9.287	22	4 29 12.97	2.5234	22 26 24.2	2.336
23	2 30 7.71	2.5139	+17 52 34.1	+9.158	23	4 31 44.32	2.5216	+22 28 39.8	+2.185
SEPTEMBER 23.					SEPTEMBER 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 32 38.60	2.5158	+18 1 39.7	+9.028	0	4 34 15.56	2.5197	+22 30 46.4	+2.035
1	2 35 9.60	2.5176	18 10 37.4	8.895	1	4 36 46.68	2.5176	22 32 44.0	1.886
2	2 37 40.71	2.5194	18 19 27.1	8.763	2	4 39 17.67	2.5153	22 34 32.7	1.737
3	2 40 11.93	2.5212	18 28 8.9	8.630	3	4 41 48.52	2.5131	22 36 12.4	1.588
4	2 42 43.25	2.5228	18 36 42.7	8.495	4	4 44 19.24	2.5108	22 37 43.2	1.438
5	2 45 14.67	2.5245	18 45 8.3	8.359	5	4 46 49.81	2.5083	22 39 5.0	1.290
6	2 47 46.19	2.5260	18 53 25.8	8.223	6	4 49 20.24	2.5058	22 40 18.0	1.143
7	2 50 17.79	2.5274	19 1 35.1	8.086	7	4 51 50.51	2.5032	22 41 22.1	0.995
8	2 52 49.48	2.5289	19 9 36.1	7.948	8	4 54 20.62	2.5005	22 42 17.4	0.848
9	2 55 21.26	2.5303	19 17 28.8	7.809	9	4 56 50.57	2.4978	22 43 3.8	0.700
10	2 57 53.12	2.5316	19 25 13.2	7.670	10	4 59 20.35	2.4948	22 43 41.4	0.554
11	3 0 25.05	2.5328	19 32 49.2	7.529	11	5 1 49.95	2.4918	22 44 10.3	0.409
12	3 2 57.05	2.5339	19 40 16.7	7.388	12	5 4 19.37	2.4888	22 44 30.5	0.264
13	3 5 29.12	2.5350	19 47 35.7	7.246	13	5 6 48.61	2.4858	22 44 42.0	+0.119
14	3 8 1.25	2.5360	19 54 46.2	7.103	14	5 9 17.66	2.4825	22 44 44.8	-0.026
15	3 10 33.44	2.5370	20 1 48.1	6.960	15	5 11 46.51	2.4793	22 44 38.9	0.169
16	3 13 5.69	2.5378	20 8 41.4	6.816	16	5 14 15.17	2.4759	22 44 24.5	0.312
17	3 15 37.98	2.5386	20 15 26.0	6.671	17	5 16 43.62	2.4724	22 44 1.5	0.454
18	3 18 10.32	2.5393	20 22 1.9	6.526	18	5 19 11.86	2.4689	22 43 30.0	0.597
19	3 20 42.70	2.5399	20 28 29.1	6.381	19	5 21 39.89	2.4654	22 42 49.9	0.738
20	3 23 15.11	2.5404	20 34 47.6	6.234	20	5 24 7.71	2.4618	22 42 1.5	0.878
21	3 25 47.55	2.5408	20 40 57.2	6.087	21	5 26 35.30	2.4579	22 41 4.6	1.018
22	3 28 20.01	2.5413	20 46 58.0	5.940	22	5 29 2.66	2.4541	22 39 59.3	1.157
23	3 30 52.50	2.5416	20 52 50.0	5.793	23	5 31 29.79	2.4503	22 38 45.8	1.295
24	3 33 25.00	2.5418	+20 58 33.1	+5.644	24	5 33 56.69	2.4463	+22 37 23.9	-1.433

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 26.					SEPTEMBER 28.				
0	h m s	s	" "	"	0	h m s	s	" "	"
0	5 33 56.69	2.4463	+22 37 23.9	-1.433	0	7 25 52.79	2.2067	+19 6 40.7	-6.973
1	5 36 23.35	2.4423	22 35 53.8	1.570	1	7 28 5.03	2.2013	18 59 39.6	7.064
2	5 38 49.76	2.4381	22 34 15.5	1.706	2	7 30 16.94	2.1959	18 52 33.0	7.154
3	5 41 15.92	2.4340	22 32 29.1	1.841	3	7 32 28.54	2.1906	18 45 21.1	7.243
4	5 43 41.84	2.4298	22 30 34.6	1.976	4	7 34 39.81	2.1852	18 38 3.9	7.330
5	5 46 7.50	2.4255	22 28 32.0	2.110	5	7 36 50.76	2.1799	18 30 41.5	7.417
6	5 48 32.90	2.4212	22 26 21.4	2.243	6	7 39 1.40	2.1746	18 23 13.9	7.503
7	5 50 58.04	2.4168	22 24 2.9	2.375	7	7 41 11.71	2.1693	18 15 41.2	7.587
8	5 53 22.92	2.4123	22 21 36.4	2.507	8	7 43 21.71	2.1640	18 8 3.5	7.670
9	5 55 47.52	2.4078	22 19 2.1	2.637	9	7 45 31.39	2.1588	18 0 20.8	7.753
10	5 58 11.86	2.4033	22 16 20.0	2.766	10	7 47 40.76	2.1536	17 52 33.1	7.835
11	6 0 35.92	2.3987	22 13 30.2	2.895	11	7 49 49.82	2.1483	17 44 40.6	7.915
12	6 2 59.70	2.3940	22 10 32.6	3.023	12	7 51 58.56	2.1431	17 36 43.3	7.994
13	6 5 23.20	2.3893	22 7 27.4	3.150	13	7 54 6.99	2.1379	17 28 41.3	8.073
14	6 7 46.42	2.3845	22 4 14.6	3.276	14	7 56 15.11	2.1328	17 20 34.6	8.151
15	6 10 9.34	2.3797	22 0 54.3	3.401	15	7 58 22.93	2.1277	17 12 23.2	8.228
16	6 12 31.98	2.3749	21 57 26.5	3.525	16	8 0 30.43	2.1225	17 4 7.3	8.303
17	6 14 54.33	2.3700	21 53 51.3	3.648	17	8 2 37.63	2.1175	16 55 46.9	8.377
18	6 17 16.38	2.3651	21 50 8.7	3.771	18	8 4 44.53	2.1124	16 47 22.1	8.450
19	6 19 38.14	2.3601	21 46 18.8	3.892	19	8 6 51.12	2.1073	16 38 52.9	8.523
20	6 21 59.59	2.3551	21 42 21.7	4.013	20	8 8 57.41	2.1024	16 30 19.3	8.595
21	6 24 20.75	2.3501	21 38 17.3	4.133	21	8 11 3.41	2.0975	16 21 41.5	8.665
22	6 26 41.60	2.3450	21 34 5.8	4.250	22	8 13 9.11	2.0925	16 12 59.5	8.735
23	6 29 2.15	2.3399	+21 29 47.3	-4.368	23	8 15 14.51	2.0876	+16 4 13.3	-8.803
SEPTEMBER 27.					SEPTEMBER 29.				
0	6 31 22.39	2.3348	+21 25 21.7	-4.484	0	8 17 19.62	2.0828	+15 55 23.1	-8.870
1	6 33 42.32	2.3296	21 20 49.2	4.599	1	8 19 24.44	2.0779	15 46 28.9	8.938
2	6 36 1.94	2.3243	21 16 9.8	4.714	2	8 21 28.97	2.0732	15 37 30.6	9.003
3	6 38 21.24	2.3191	21 11 23.5	4.828	3	8 23 33.22	2.0684	15 28 28.5	9.068
4	6 40 40.23	2.3139	21 6 30.5	4.940	4	8 25 37.18	2.0637	15 19 22.5	9.132
5	6 42 58.91	2.3087	21 1 30.7	5.052	5	8 27 40.86	2.0590	15 10 12.7	9.194
6	6 45 17.27	2.3033	20 56 24.3	5.163	6	8 29 44.26	2.0543	15 0 59.2	9.256
7	6 47 35.31	2.2980	20 51 11.2	5.272	7	8 31 47.38	2.0498	14 51 42.0	9.318
8	6 49 53.03	2.2928	20 45 51.7	5.379	8	8 33 50.23	2.0452	14 42 21.1	9.378
9	6 52 10.44	2.2874	20 40 25.7	5.488	9	8 35 52.80	2.0407	14 32 56.7	9.437
10	6 54 27.52	2.2821	20 34 53.2	5.594	10	8 37 55.11	2.0362	14 23 28.7	9.495
11	6 56 44.29	2.2768	20 29 14.4	5.699	11	8 39 57.14	2.0317	14 13 57.3	9.552
12	6 59 0.73	2.2713	20 23 29.3	5.803	12	8 41 58.91	2.0273	14 4 22.5	9.608
13	7 1 16.85	2.2659	20 17 38.0	5.906	13	8 44 0.42	2.0229	13 54 44.3	9.663
14	7 3 32.64	2.2605	20 11 40.6	6.008	14	8 46 1.66	2.0186	13 45 2.9	9.718
15	7 5 48.11	2.2552	20 5 37.0	6.109	15	8 48 2.65	2.0143	13 35 18.2	9.772
16	7 8 3.26	2.2498	19 59 27.4	6.209	16	8 50 3.38	2.0101	13 25 30.3	9.824
17	7 10 18.09	2.2444	19 53 11.9	6.308	17	8 52 3.86	2.0059	13 15 39.3	9.876
18	7 12 32.59	2.2389	19 46 50.4	6.407	18	8 54 4.09	2.0018	13 5 45.2	9.928
19	7 14 46.76	2.2335	19 40 23.0	6.504	19	8 56 4.07	1.9977	12 55 48.0	9.978
20	7 17 0.61	2.2282	19 33 49.9	6.599	20	8 58 3.81	1.9936	12 45 47.9	10.026
21	7 19 14.14	2.2228	19 27 11.1	6.695	21	9 0 3.30	1.9896	12 35 44.9	10.074
22	7 21 27.35	2.2174	19 20 26.5	6.789	22	9 2 2.56	1.9857	12 25 39.0	10.123
23	7 23 40.23	2.2120	19 13 36.4	6.882	23	9 4 1.58	1.9817	12 15 30.3	10.168
24	7 25 52.79	2.2067	+19 6 40.7	-6.973	24	9 6 0.36	1.9778	+12 5 18.8	-9

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.
SEPTEMBER 30.					OCTOBER 2.			
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]
0	9 6 0.36	1.9778	+12 5 18.8	-10.214	0	10 37 25.29	1.8510	+3 17 51.6
1	9 7 58.91	1.9739	11 55 4.6	10.258	1	10 39 16.31	1.8496	3 6 23.3
2	9 9 57.23	1.9702	11 44 47.8	10.303	2	10 41 7.24	1.8483	2 54 54.5
3	9 11 55.33	1.9665	11 34 28.3	10.346	3	10 42 58.11	1.8471	2 43 25.4
4	9 13 53.21	1.9628	11 24 6.3	10.388	4	10 44 48.89	1.8458	2 31 55.8
5	9 15 50.86	1.9591	11 13 41.7	10.430	5	10 46 39.61	1.8447	2 20 25.9
6	9 17 48.30	1.9556	11 3 14.7	10.470	6	10 48 30.25	1.8435	2 8 55.8
7	9 19 45.53	1.9520	10 52 45.3	10.510	7	10 50 20.83	1.8425	1 57 25.4
8	9 21 42.54	1.9485	10 42 13.5	10.548	8	10 52 11.35	1.8415	1 45 54.8
9	9 23 39.35	1.9451	10 31 39.5	10.587	9	10 54 1.81	1.8405	1 34 24.0
10	9 25 35.95	1.9417	10 21 3.1	10.625	10	10 55 52.21	1.8396	1 22 53.1
11	9 27 32.35	1.9383	10 10 24.5	10.661	11	10 57 42.56	1.8388	1 11 22.2
12	9 29 28.55	1.9351	9 59 43.8	10.696	12	10 59 32.86	1.8379	0 59 51.2
13	9 31 24.56	1.9318	9 49 1.0	10.731	13	11 1 23.11	1.8372	0 48 20.2
14	9 33 20.37	1.9286	9 38 16.1	10.766	14	11 3 13.32	1.8365	0 36 49.3
15	9 35 15.99	1.9255	9 27 23.1	10.799	15	11 5 3.49	1.8358	0 25 18.4
16	9 37 11.43	1.9224	9 16 40.2	10.831	16	11 6 53.62	1.8353	0 13 47.7
17	9 39 6.68	1.9193	9 5 49.4	10.863	17	11 8 43.72	1.8348	+0 2 17.2
18	9 41 1.75	1.9163	8 54 56.7	10.893	18	11 10 33.79	1.8343	-0 9 13.2
19	9 42 56.64	1.9134	8 44 2.2	10.923	19	11 12 23.83	1.8338	0 20 43.2
20	9 44 51.36	1.9106	8 33 5.9	10.953	20	11 14 13.84	1.8333	0 32 13.0
21	9 46 45.91	1.9078	8 22 7.9	10.981	21	11 16 3.83	1.8330	0 43 42.5
22	9 48 40.29	1.9049	8 11 8.2	11.009	22	11 17 53.80	1.8327	0 55 11.6
23	9 50 34.50	1.9022	+ 8 0 6.8	-11.036	23	11 19 43.75	1.8324	-1 6 40.2
OCTOBER 1.					OCTOBER 3.			
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]
0	9 52 28.55	1.8995	+ 7 49 3.9	-11.062	0	11 21 33.69	1.8323	-1 18 8.4
1	9 54 22.44	1.8969	7 37 59.4	11.088	1	11 23 23.62	1.8321	1 29 36.1
2	9 56 16.18	1.8944	7 26 53.4	11.113	2	11 25 13.54	1.8319	1 41 3.3
3	9 58 9.77	1.8918	7 15 45.9	11.137	3	11 27 3.45	1.8319	1 52 29.8
4	10 0 3.20	1.8893	7 4 37.0	11.159	4	11 28 53.37	1.8319	2 3 55.8
5	10 1 56.49	1.8869	6 53 26.8	11.182	5	11 30 43.28	1.8319	2 15 21.1
6	10 3 49.63	1.8845	6 42 15.2	11.203	6	11 32 33.20	1.8321	2 26 45.7
7	10 5 42.63	1.8823	6 31 2.4	11.224	7	11 34 23.13	1.8322	2 38 9.6
8	10 7 35.50	1.8800	6 19 48.3	11.245	8	11 36 13.06	1.8323	2 49 32.7
9	10 9 28.23	1.8778	6 8 33.0	11.264	9	11 38 3.01	1.8327	3 0 54.9
10	10 11 20.83	1.8756	5 57 16.6	11.283	10	11 39 52.98	1.8329	3 12 16.4
11	10 13 13.30	1.8735	5 45 59.1	11.300	11	11 41 42.96	1.8332	3 23 36.9
12	10 15 5.65	1.8715	5 34 40.6	11.317	12	11 43 32.96	1.8336	3 34 56.4
13	10 16 57.88	1.8695	5 23 21.1	11.334	13	11 45 22.99	1.8340	3 46 15.0
14	10 18 49.99	1.8676	5 12 0.5	11.350	14	11 47 13.04	1.8344	3 57 32.5
15	10 20 41.99	1.8657	5 0 39.1	11.364	15	11 49 3.12	1.8350	4 8 49.0
16	10 22 33.87	1.8638	4 49 16.8	11.379	16	11 50 53.24	1.8356	4 20 4.4
17	10 24 25.64	1.8620	4 37 53.6	11.393	17	11 52 43.39	1.8362	4 31 18.7
18	10 26 17.31	1.8603	4 26 29.7	11.406	18	11 54 33.58	1.8368	4 42 31.7
19	10 28 8.88	1.8587	4 15 4.9	11.418	19	11 56 23.80	1.8375	4 53 43.6
20	10 30 0.35	1.8570	4 3 39.5	11.429	20	11 58 14.08	1.8383	5 4 54.2
21	10 31 51.72	1.8554	3 52 13.4	11.440	21	12 0 4.39	1.8390	5 16 3.4
22	10 33 43.00	1.8539	3 40 46.7	11.450	22	12 1 54.76	1.8399	5 27 11.4
23	10 35 34.19	1.8524	3 29 19.4	11.459	23	12 3 45.18	1.8408	5 38 17.9
24	10 37 25.29	1.8510	+ 3 17 51.6	-11.468	24	12 5 35.65	1.8417	-5 49 23.0

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 4.					OCTOBER 6.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 5 35.65	1.8417	- 5 49 23.0	-11.073	0	13 35 49.94	1.9322	-14 0 14.4	-9.117
1	12 7 26.18	1.8427	6 0 26.6	11.048	1	13 37 45.95	1.9349	14 9 19.7	9.059
2	12 9 16.77	1.8437	6 11 28.8	11.023	2	13 39 42.13	1.9377	14 18 21.5	9.001
3	12 11 7.42	1.8448	6 22 29.4	10.997	3	13 41 38.47	1.9404	14 27 19.8	8.943
4	12 12 58.14	1.8458	6 33 28.4	10.969	4	13 43 34.98	1.9432	14 36 14.6	8.883
5	12 14 48.92	1.8469	6 44 25.7	10.942	5	13 45 31.65	1.9459	14 45 5.7	8.822
6	12 16 39.77	1.8482	6 55 21.4	10.914	6	13 47 28.49	1.9488	14 53 53.2	8.762
7	12 18 30.70	1.8494	7 6 15.4	10.886	7	13 49 25.50	1.9516	15 2 37.1	8.700
8	12 20 21.70	1.8507	7 17 7.7	10.856	8	13 51 22.68	1.9544	15 11 17.2	8.637
9	12 22 12.78	1.8520	7 27 58.1	10.825	9	13 53 20.03	1.9573	15 19 53.5	8.573
10	12 24 3.94	1.8533	7 38 46.7	10.795	10	13 55 17.55	1.9603	15 28 26.0	8.510
11	12 25 55.18	1.8547	7 49 33.5	10.763	11	13 57 15.26	1.9632	15 36 54.7	8.446
12	12 27 46.50	1.8561	8 0 18.3	10.731	12	13 59 13.13	1.9660	15 45 19.5	8.381
13	12 29 37.91	1.8576	8 11 1.2	10.698	13	14 1 11.18	1.9690	15 53 40.4	8.315
14	12 31 29.41	1.8591	8 21 42.1	10.664	14	14 3 9.41	1.9720	16 1 57.3	8.248
15	12 33 21.00	1.8607	8 32 20.9	10.630	15	14 5 7.82	1.9750	16 10 10.2	8.181
16	12 35 12.69	1.8623	8 42 57.7	10.596	16	14 7 6.41	1.9781	16 18 19.0	8.113
17	12 37 4.47	1.8639	8 53 32.4	10.560	17	14 9 5.19	1.9811	16 26 23.8	8.045
18	12 38 56.36	1.8656	9 4 4.9	10.523	18	14 11 4.14	1.9840	16 34 24.4	7.976
19	12 40 48.34	1.8673	9 14 35.2	10.487	19	14 13 3.27	1.9871	16 42 20.9	7.906
20	12 42 40.43	1.8691	9 25 3.3	10.449	20	14 15 2.59	1.9903	16 50 13.1	7.835
21	12 44 32.63	1.8708	9 35 29.1	10.411	21	14 17 2.10	1.9933	16 58 1.1	7.763
22	12 46 24.93	1.8727	9 45 52.6	10.372	22	14 19 1.78	1.9963	17 5 44.7	7.692
23	12 48 17.35	1.8746	- 9 56 13.7	-10.332	23	14 21 1.66	1.9995	-17 13 24.1	-7.619
OCTOBER 5.					OCTOBER 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 50 9.88	1.8765	-10 6 32.4	-10.292	0	14 23 1.72	2.0026	-17 20 59.0	-7.545
1	12 52 2.53	1.8784	10 16 48.7	10.251	1	14 25 1.97	2.0058	17 28 29.5	7.472
2	12 53 55.29	1.8803	10 27 2.5	10.208	2	14 27 2.41	2.0088	17 35 55.6	7.398
3	12 55 48.17	1.8824	10 37 13.7	10.166	3	14 29 3.03	2.0120	17 43 17.2	7.322
4	12 57 41.18	1.8845	10 47 22.4	10.123	4	14 31 3.85	2.0152	17 50 34.2	7.245
5	12 59 34.31	1.8865	10 57 28.5	10.080	5	14 33 4.85	2.0183	17 57 46.6	7.169
6	13 1 27.56	1.8886	11 7 32.0	10.036	6	14 35 6.04	2.0214	18 4 54.5	7.092
7	13 3 20.94	1.8908	11 17 32.8	9.990	7	14 37 7.42	2.0247	18 11 57.6	7.013
8	13 5 14.46	1.8930	11 27 30.8	9.944	8	14 39 9.00	2.0278	18 18 56.1	6.935
9	13 7 8.10	1.8952	11 37 26.1	9.898	9	14 41 10.76	2.0310	18 25 49.8	6.856
10	13 9 1.88	1.8975	11 47 18.5	9.850	10	14 43 12.72	2.0342	18 32 38.8	6.776
11	13 10 55.80	1.8998	11 57 8.1	9.803	11	14 45 14.86	2.0373	18 39 22.9	6.694
12	13 12 49.85	1.9020	12 6 54.8	9.754	12	14 47 17.20	2.0406	18 46 2.1	6.613
13	13 14 44.04	1.9044	12 16 38.6	9.705	13	14 49 19.73	2.0438	18 52 36.4	6.531
14	13 16 38.38	1.9068	12 26 19.4	9.655	14	14 51 22.45	2.0470	18 59 5.8	6.449
15	13 18 32.86	1.9092	12 35 57.2	9.604	15	14 53 25.37	2.0503	19 5 30.3	6.366
16	13 20 27.48	1.9117	12 45 31.9	9.553	16	14 55 28.48	2.0533	19 11 49.7	6.281
17	13 22 22.26	1.9142	12 55 3.5	9.501	17	14 57 31.77	2.0565	19 18 4.0	6.197
18	13 24 17.18	1.9166	13 4 32.0	9.448	18	14 59 35.26	2.0598	19 24 13.3	6.112
19	13 26 12.25	1.9192	13 13 57.3	9.394	19	15 1 38.95	2.0630	19 30 17.4	6.025
20	13 28 7.48	1.9218	13 23 19.3	9.340	20	15 3 42.82	2.0661	19 36 16.3	5.939
21	13 30 2.86	1.9243	13 32 38.1	9.286	21	15 5 46.88	2.0693	19 42 10.1	5.852
22	13 31 58.39	1.9269	13 41 53.6	9.230	22	15 7 51.13	2.0725	19 47 58.5	5.763
23	13 33 54.09	1.9296	13 51 5.7	9.173	23	15 9 55.58	2.0757	19 53 41.7	5.676
24	13 35 49.94	1.9322	-14 0 14.4	-9.117	24	15 12 0.21	2.0788	-19 59 19.6	-5.587

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.				
OCTOBER 8.							OCTOBER 10.										
	h	m	s	s	°	'	''		h	m	s	s	°	'	''	'''	
0	15	12	0.21	2.0788	-19	59	19.6	-5.587	0	16	55	6.04	2.2070	-22	34	15.1	-0.679
1	15	14	5.03	2.0819	20	4	52.1	5.498	1	16	57	18.52	2.2088	22	34	52.5	0.567
2	15	16	10.04	2.0851	20	10	19.3	5.408	2	16	59	31.10	2.2107	22	35	23.1	0.453
3	15	18	15.24	2.0883	20	15	41.0	5.316	3	17	1	43.80	2.2126	22	35	46.9	0.346
4	15	20	20.63	2.0913	20	20	57.2	5.225	4	17	3	56.61	2.2143	22	36	3.9	0.227
5	15	22	26.20	2.0944	20	26	8.0	5.133	5	17	6	9.52	2.2161	22	36	14.1	-0.113
6	15	24	31.96	2.0976	20	31	13.1	5.040	6	17	8	22.54	2.2178	22	36	17.4	+0.003
7	15	26	37.91	2.1007	20	36	12.8	4.948	7	17	10	35.66	2.2194	22	36	13.8	0.117
8	15	28	44.04	2.1038	20	41	6.8	4.853	8	17	12	48.87	2.2211	22	36	3.4	0.232
9	15	30	50.36	2.1068	20	45	55.1	4.758	9	17	15	2.19	2.2227	22	35	46.0	0.347
10	15	32	56.86	2.1098	20	50	37.8	4.663	10	17	17	15.59	2.2242	22	35	21.8	0.462
11	15	35	3.54	2.1128	20	55	14.7	4.568	11	17	19	29.09	2.2258	22	34	50.6	0.578
12	15	37	10.40	2.1158	20	59	45.9	4.472	12	17	21	42.68	2.2273	22	34	12.5	0.693
13	15	39	17.44	2.1188	21	4	11.3	4.375	13	17	23	56.36	2.2286	22	33	27.4	0.809
14	15	41	24.66	2.1218	21	8	30.9	4.278	14	17	26	10.11	2.2299	22	32	35.4	0.925
15	15	43	32.06	2.1248	21	12	44.6	4.180	15	17	28	23.95	2.2313	22	31	36.4	1.041
16	15	45	39.64	2.1278	21	16	52.5	4.082	16	17	30	37.87	2.2327	22	30	30.5	1.158
17	15	47	47.39	2.1306	21	20	54.4	3.982	17	17	32	51.87	2.2338	22	29	17.5	1.274
18	15	49	55.31	2.1335	21	24	50.3	3.883	18	17	35	5.93	2.2350	22	27	57.6	1.391
19	15	52	3.41	2.1364	21	28	40.3	3.783	19	17	37	20.07	2.2363	22	26	30.6	1.508
20	15	54	11.68	2.1393	21	32	24.3	3.683	20	17	39	34.28	2.2374	22	24	56.6	1.625
21	15	56	20.12	2.1421	21	36	2.2	3.582	21	17	41	48.56	2.2384	22	23	15.6	1.742
22	15	58	28.73	2.1448	21	39	34.1	3.480	22	17	44	2.89	2.2394	22	21	27.6	1.859
23	16	0	37.50	2.1476	-21	42	59.8	-3.378	23	17	46	17.29	2.2405	-22	19	32.5	+1.977
OCTOBER 9.							OCTOBER 11.										
0	16	2	46.44	2.1503	-21	46	19.4	-3.275	0	17	48	31.75	2.2415	-22	17	30.4	+2.093
1	16	4	55.54	2.1531	21	49	32.8	3.173	1	17	50	46.27	2.2424	22	15	21.3	2.211
2	16	7	4.81	2.1558	21	52	40.0	3.069	2	17	53	0.84	2.2433	22	13	5.1	2.329
3	16	9	14.24	2.1585	21	55	41.0	2.964	3	17	55	15.46	2.2441	22	10	41.8	2.447
4	16	11	23.83	2.1611	21	58	35.7	2.860	4	17	57	30.13	2.2448	22	8	11.5	2.564
5	16	13	33.57	2.1637	22	1	24.2	2.755	5	17	59	44.84	2.2456	22	5	34.1	2.682
6	16	15	43.47	2.1663	22	4	6.3	2.649	6	18	1	59.60	2.2463	22	2	49.7	2.800
7	16	17	53.52	2.1688	22	6	42.1	2.543	7	18	4	14.40	2.2471	21	59	58.1	2.918
8	16	20	3.73	2.1713	22	9	11.5	2.437	8	18	6	29.25	2.2478	21	56	59.6	3.035
9	16	22	14.08	2.1738	22	11	34.5	2.330	9	18	8	44.13	2.2483	21	53	53.9	3.153
10	16	24	24.59	2.1763	22	13	51.1	2.223	10	18	10	59.04	2.2488	21	50	41.2	3.271
11	16	26	35.24	2.1787	22	16	1.2	2.115	11	18	13	13.99	2.2494	21	47	21.4	3.389
12	16	28	46.03	2.1811	22	18	4.9	2.008	12	18	15	28.97	2.2499	21	43	54.5	3.507
13	16	30	56.97	2.1835	22	20	2.1	1.898	13	18	17	43.98	2.2503	21	40	20.6	3.623
14	16	33	8.05	2.1858	22	21	52.7	1.789	14	18	19	59.01	2.2507	21	36	39.7	3.741
15	16	35	19.26	2.1880	22	23	36.8	1.680	15	18	22	14.06	2.2511	21	32	51.7	3.859
16	16	37	30.61	2.1903	22	25	14.3	1.570	16	18	24	29.14	2.2515	21	28	56.6	3.977
17	16	39	42.09	2.1925	22	26	45.2	1.461	17	18	26	44.24	2.2518	21	24	54.5	4.093
18	16	41	53.71	2.1948	22	28	9.6	1.350	18	18	28	59.35	2.2520	21	20	45.4	4.211
19	16	44	5.46	2.1968	22	29	27.2	1.238	19	18	31	14.48	2.2523	21	16	29.2	4.328
20	16	46	17.33	2.1988	22	30	38.2	1.128	20	18	33	29.63	2.2526	21	12	6.1	4.444
21	16	48	29.32	2.2009	22	31	42.5	1.016	21	18	35	44.79	2.2527	21	7	35.9	4.562
22	16	50	41.44	2.2030	22	32	40.1	0.904	22	18	37	59.95	2.2528	21	2	58.7	4.678
23	16	52	53.68	2.2050	22	33	31.0	0.792	23	18	40	15.13	2.2530	20	58	14.5	4.795
24	16	55	6.04	2.2070	-22	34	15.1	-0.679	24	18	42	30.31	2.2531	-20	53	23.3	+4.911

GREENWICH MEAN TIME.

Right ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 12.				OCTOBER 14.				
m s s ° ' "				0	h m s s ° ' "			
42 30.31 2.2531 -20 53 23.3 + 4.911				1	20 30 21.53 2.2373 -14 49 31.4 +10.079			
44 45.50 2.2531 20 48 25.2 5.028				2	20 32 35.75 2.2369 14 39 23.8 10.173			
47 0.68 2.2531 20 43 20.0 5.143				2	20 34 49.96 2.2366 14 29 10.6 10.268			
49 15.87 2.2531 20 38 8.0 5.258				3	20 37 4.14 2.2362 14 18 51.7 10.361			
51 31.05 2.2531 20 32 49.0 5.374				4	20 39 18.30 2.2359 14 8 27.3 10.453			
53 46.24 2.2531 20 27 23.1 5.490				5	20 41 32.45 2.2356 13 57 57.3 10.545			
56 1.42 2.2529 20 21 50.2 5.605				6	20 43 46.57 2.2353 13 47 21.9 10.635			
58 16.59 2.2528 20 16 10.5 5.719				7	20 46 0.68 2.2351 13 36 41.1 10.725			
0 31.76 2.2528 20 10 23.9 5.834				8	20 48 14.78 2.2348 13 25 54.9 10.815			
2 46.92 2.2526 20 4 30.4 5.948				9	20 50 28.86 2.2345 13 15 3.3 10.903			
5 2.07 2.2523 19 58 30.1 6.062				10	20 52 42.92 2.2343 13 4 6.5 10.991			
7 17.20 2.2522 19 52 23.0 6.176				11	20 54 56.98 2.2342 12 53 4.4 11.078			
9 32.33 2.2520 19 46 9.0 6.290				12	20 57 11.02 2.2340 12 41 57.2 11.163			
11 47.44 2.2517 19 39 48.2 6.403				13	20 59 25.06 2.2338 12 30 44.9 11.248			
14 2.53 2.2514 19 33 20.7 6.515				14	21 1 39.08 2.2338 12 19 27.4 11.333			
16 17.61 2.2512 19 26 46.4 6.628				15	21 3 53.11 2.2338 12 8 5.0 11.416			
18 32.67 2.2508 19 20 5.3 6.740				16	21 6 7.13 2.2336 11 56 37.5 11.498			
20 47.71 2.2505 19 13 17.6 6.852				17	21 8 21.14 2.2336 11 45 5.2 11.579			
23 2.73 2.2502 19 6 23.1 6.963				18	21 10 35.16 2.2336 11 33 28.0 11.660			
25 17.73 2.2498 18 59 22.0 7.073				19	21 12 49.17 2.2336 11 21 46.0 11.740			
27 32.71 2.2495 18 52 14.3 7.185				20	21 15 3.19 2.2337 11 9 59.2 11.819			
29 47.67 2.2491 18 44 59.8 7.296				21	21 17 17.21 2.2338 10 58 7.7 11.897			
32 2.60 2.2487 18 37 38.8 7.405				22	21 19 31.24 2.2339 10 46 11.6 11.973			
34 17.51 2.2483 -18 30 11.2 + 7.514				23	21 21 45.28 2.2340 -10 34 10.9 +12.049			
OCTOBER 13.				OCTOBER 15.				
36 32.39 2.2478 -18 22 37.1 + 7.623				0	21 23 59.32 2.2342 -10 22 5.7 +12.124			
38 47.25 2.2474 18 14 56.5 7.732				1	21 26 13.38 2.2344 10 9 56.0 12.198			
41 2.08 2.2470 18 7 9.3 7.840				2	21 28 27.45 2.2347 9 57 41.9 12.271			
43 16.89 2.2466 17 59 15.7 7.947				3	21 30 41.54 2.2350 9 45 23.5 12.343			
45 31.67 2.2461 17 51 15.7 8.054				4	21 32 55.65 2.2353 9 33 0.8 12.414			
47 46.42 2.2457 17 43 9.2 8.162				5	21 35 9.78 2.2353 9 20 33.8 12.483			
50 1.15 2.2453 17 34 56.3 8.268				6	21 37 23.94 2.2361 9 8 2.8 12.552			
52 15.85 2.2448 17 26 37.1 8.373				7	21 39 38.11 2.2365 8 55 27.6 12.620			
54 30.52 2.2443 17 18 11.6 8.478				8	21 41 52.32 2.2370 8 42 48.4 12.687			
56 45.16 2.2438 17 9 39.8 8.583				9	21 44 6.55 2.2375 8 30 5.2 12.753			
58 59.77 2.2433 17 1 1.7 8.687				10	21 46 20.82 2.2381 8 17 18.1 12.816			
1 14.36 2.2429 16 52 17.4 8.790				11	21 48 35.12 2.2387 8 4 27.3 12.879			
3 28.92 2.2424 16 43 26.9 8.893				12	21 50 49.46 2.2393 7 51 32.6 12.942			
5 43.45 2.2419 16 34 30.3 8.995				13	21 53 3.84 2.2400 7 38 34.3 13.003			
7 57.95 2.2415 16 25 27.5 9.097				14	21 55 18.26 2.2407 7 25 32.3 13.063			
10 12.43 2.2411 16 16 18.7 9.198				15	21 57 32.72 2.2415 7 12 26.8 13.120			
12 26.88 2.2406 16 7 3.8 9.298				16	21 59 47.24 2.2423 6 59 17.9 13.178			
14 41.30 2.2401 15 57 42.9 9.398				17	22 2 1.80 2.2431 6 46 5.5 13.234			
16 55.69 2.2397 15 48 16.0 9.498				18	22 4 16.41 2.2440 6 32 49.8 13.289			
19 10.06 2.2393 15 38 43.2 9.597				19	22 6 31.08 2.2450 6 19 30.8 13.343			
21 24.41 2.2388 15 29 4.4 9.694				20	22 8 45.81 2.2460 6 6 8.7 13.395			
23 38.72 2.2384 15 19 19.9 9.791				21	22 11 0.60 2.2470 5 52 43.4 13.447			
25 53.02 2.2380 15 9 29.5 9.888				22	22 13 15.45 2.2481 5 39 15.1 13.497			
28 7.28 2.2376 14 59 33.3 9.984				23	22 15 30.37 2.2492 5 25 43.8 13.545			
30 21.53 2.2373 -14 49 31.4 +10.079				24	22 17 45.35 2.2503 -5 12 9.7 +13.592			

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			
OCTOBER 16.									OCTOBER 18.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	
0	22	17	45.35	2.2503	-5	12	9.7	+13.592	0	0	8	2.60	2.3633	+	6	6 48.8	
1	22	20	0.41	2.2515	4	58	32.8	13.638	1	0	10	24.50	2.3668		6	20 52.4	
2	22	22	15.53	2.2528	4	44	53.1	13.683	2	0	12	46.62	2.3703		6	34 54.0	
3	22	24	30.74	2.2542	4	31	10.9	13.725	3	0	15	8.94	2.3738		6	48 53.5	
4	22	26	46.03	2.2555	4	17	26.1	13.768	4	0	17	31.48	2.3774		7	2 50.9	
5	22	29	1.40	2.2568	4	3	38.8	13.808	5	0	19	54.23	2.3810		7	16 45.9	
6	22	31	16.85	2.2583	3	49	49.1	13.848	6	0	22	17.20	2.3847		7	30 38.6	
7	22	33	32.40	2.2598	3	35	57.1	13.886	7	0	24	40.39	2.3883		7	44 28.7	
8	22	35	48.03	2.2613	3	22	2.8	13.922	8	0	27	3.80	2.3920		7	58 16.1	
9	22	38	3.76	2.2630	3	8	6.5	13.956	9	0	29	27.43	2.3957		8	12 0.8	
10	22	40	19.59	2.2647	2	54	8.1	13.990	10	0	31	51.28	2.3994		8	25 42.6	
11	22	42	35.52	2.2663	2	40	7.7	14.023	11	0	34	15.36	2.4032		8	39 21.5	
12	22	44	51.55	2.2681	2	26	5.4	14.053	12	0	36	39.66	2.4069		8	52 57.2	
13	22	47	7.69	2.2699	2	12	1.3	14.082	13	0	39	4.19	2.4108		9	6 29.7	
14	22	49	23.94	2.2718	1	57	55.6	14.109	14	0	41	28.95	2.4146		9	19 58.9	
15	22	51	40.30	2.2737	1	43	48.2	14.136	15	0	43	53.94	2.4185		9	33 24.6	
16	22	53	56.78	2.2756	1	29	39.3	14.160	16	0	46	19.17	2.4223		9	46 46.8	
17	22	56	13.37	2.2776	1	15	29.0	14.183	17	0	48	44.62	2.4262		10	0 5.3	
18	22	58	30.09	2.2797	1	1	17.3	14.205	18	0	51	10.31	2.4301		10	13 20.1	
19	23	0	46.93	2.2818	0	47	4.4	14.225	19	0	53	36.23	2.4340		10	26 30.9	
20	23	3	3.90	2.2839	0	32	50.3	14.244	20	0	56	2.39	2.4380		10	39 37.7	
21	23	5	21.00	2.2861	0	18	35.1	14.261	21	0	58	28.79	2.4419		10	52 40.4	
22	23	7	38.23	2.2883	-0	4	19.0	14.276	22	1	0	55.42	2.4458		11	5 38.9	
23	23	9	55.60	2.2907	+0	9	58.0	+14.289	23	1	3	22.29	2.4498	+11	18 33.0		
OCTOBER 17.									OCTOBER 19.								
0	23	12	13.11	2.2930	+0	24	15.7	+14.301	0	1	5	49.39	2.4537	+11	31 22.7		
1	23	14	30.76	2.2954	0	38	34.1	14.312	1	1	8	16.73	2.4578		11	44 7.8	
2	23	16	48.56	2.2978	0	52	53.1	14.321	2	1	10	44.32	2.4617		11	56 48.2	
3	23	19	6.50	2.3003	1	7	12.6	14.328	3	1	13	12.13	2.4656		12	9 23.8	
4	23	21	24.60	2.3029	1	21	32.4	14.333	4	1	15	40.19	2.4696		12	21 54.5	
5	23	23	42.85	2.3055	1	35	52.5	14.337	5	1	18	8.48	2.4735		12	34 20.1	
6	23	26	1.26	2.3082	1	50	12.8	14.338	6	1	20	37.01	2.4775		12	46 40.7	
7	23	28	19.83	2.3108	2	4	33.1	14.339	7	1	23	5.78	2.4815		12	58 56.0	
8	23	30	38.56	2.3136	2	18	53.5	14.338	8	1	25	34.79	2.4853		13	11 5.9	
9	23	32	57.46	2.3164	2	33	13.7	14.334	9	1	28	4.02	2.4892		13	23 10.4	
10	23	35	16.53	2.3192	2	47	33.6	14.329	10	1	30	33.49	2.4932		13	35 9.2	
11	23	37	35.76	2.3220	3	1	53.2	14.323	11	1	33	3.20	2.4971		13	47 2.5	
12	23	39	55.17	2.3249	3	16	12.4	14.315	12	1	35	33.14	2.5009		13	58 49.9	
13	23	42	14.75	2.3279	3	30	31.0	14.305	13	1	38	3.31	2.5048		14	10 31.4	
14	23	44	34.52	2.3310	3	44	49.0	14.293	14	1	40	33.72	2.5087		14	22 7.0	
15	23	46	54.47	2.3340	3	59	6.2	14.279	15	1	43	4.35	2.5124		14	33 36.4	
16	23	49	14.60	2.3370	4	13	22.5	14.264	16	1	45	35.21	2.5162		14	44 59.7	
17	23	51	34.91	2.3402	4	27	37.9	14.247	17	1	48	6.29	2.5199		14	56 16.6	
18	23	53	55.42	2.3434	4	41	52.1	14.228	18	1	50	37.60	2.5238		15	7 27.1	
19	23	56	16.12	2.3467	4	56	5.2	14.208	19	1	53	9.14	2.5274		15	18 31.2	
20	23	58	37.02	2.3499	5	10	17.0	14.184	20	1	55	40.89	2.5309		15	29 28.6	
21	0	0	58.11	2.3533	5	24	27.3	14.160	21	1	58	12.85	2.5346		15	40 19.3	
22	0	3	19.41	2.3566	5	38	36.2	14.134	22	2	0	45.04	2.5382		15	51 3.2	
23	0	5	40.90	2.3599	5	52	43.4	14.105	23	2	3	17.43	2.5417		16	1 40.2	
24	0	8	2.60	2.3633	+6	6	48.8	+14.075	24	2	5	50.04	2.5453	+16	12 10.2		

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 20.					OCTOBER 22.				
0	h m s	s	" "	" "	0	h m s	s	" "	" "
0	2 5 50.04	2.5433	+16 12 10.2	+10.441	0	4 10 39.39	2.6192	+21 54 12.7	+3.473
1	2 8 22.86	2.5487	16 22 33.1	10.322	1	4 13 16.51	2.6182	21 57 36.3	3.313
2	2 10 55.88	2.5521	16 32 48.8	10.201	2	4 15 53.57	2.6170	22 0 50.3	3.153
3	2 13 29.11	2.5554	16 42 57.2	10.079	3	4 18 30.55	2.6157	22 3 54.7	2.993
4	2 16 2.53	2.5587	16 52 58.3	9.956	4	4 21 7.45	2.6143	22 6 49.5	2.833
5	2 18 36.15	2.5619	17 2 51.9	9.830	5	4 23 44.26	2.6127	22 9 34.7	2.673
6	2 21 9.96	2.5651	17 12 37.9	9.703	6	4 26 20.97	2.6110	22 12 10.3	2.514
7	2 23 43.96	2.5682	17 22 16.3	9.577	7	4 28 57.58	2.6092	22 14 36.4	2.355
8	2 26 18.14	2.5712	17 31 47.1	9.448	8	4 31 34.07	2.6073	22 16 52.9	2.195
9	2 28 52.50	2.5743	17 41 10.0	9.316	9	4 34 10.46	2.6053	22 18 59.8	2.036
10	2 31 27.05	2.5772	17 50 25.0	9.184	10	4 36 46.71	2.6032	22 20 57.2	1.878
11	2 34 1.76	2.5799	17 59 32.1	9.052	11	4 39 22.84	2.6009	22 22 45.1	1.719
12	2 36 36.64	2.5828	18 8 31.2	8.918	12	4 41 58.82	2.5985	22 24 23.5	1.561
13	2 39 11.69	2.5855	18 17 22.2	8.781	13	4 44 34.66	2.5960	22 25 52.4	1.403
14	2 41 46.90	2.5881	18 26 4.9	8.643	14	4 47 10.34	2.5933	22 27 11.8	1.246
15	2 44 22.26	2.5906	18 34 39.4	8.506	15	4 49 45.86	2.5906	22 28 21.9	1.088
16	2 46 57.77	2.5931	18 43 5.6	8.366	16	4 52 21.21	2.5878	22 29 22.4	0.932
17	2 49 33.43	2.5955	18 51 23.3	8.225	17	4 54 56.39	2.5848	22 30 13.7	0.776
18	2 52 9.23	2.5978	18 59 32.6	8.083	18	4 57 31.39	2.5818	22 30 55.5	0.619
19	2 54 45.16	2.6000	19 7 33.3	7.941	19	5 0 6.20	2.5786	22 31 28.0	0.465
20	2 57 21.23	2.6022	19 15 25.5	7.797	20	5 2 40.82	2.5753	22 31 51.3	0.311
21	2 59 57.42	2.6042	19 23 8.9	7.652	21	5 5 15.23	2.5718	22 32 5.3	0.156
22	3 2 33.73	2.6061	19 30 43.7	7.507	22	5 7 49.44	2.5683	22 32 10.0	+0.003
23	3 5 10.15	2.6079	+19 38 9.7	+7.359	23	5 10 23.43	2.5648	+22 32 5.6	-0.150
OCTOBER 21.					OCTOBER 23.				
0	3 7 46.68	2.6097	+19 45 26.8	+7.211	0	5 12 57.21	2.5611	+22 31 52.0	-0.303
1	3 10 23.31	2.6113	19 52 35.0	7.063	1	5 15 30.76	2.5572	22 31 29.3	0.453
2	3 13 0.04	2.6129	19 59 34.3	6.913	2	5 18 4.07	2.5533	22 30 57.6	0.603
3	3 15 36.86	2.6144	20 6 24.6	6.763	3	5 20 37.15	2.5493	22 30 16.9	0.754
4	3 18 13.77	2.6158	20 13 5.8	6.611	4	5 23 9.98	2.5451	22 29 27.1	0.903
5	3 20 50.75	2.6169	20 19 37.9	6.459	5	5 25 42.56	2.5409	22 28 28.5	1.051
6	3 23 27.80	2.6181	20 26 0.9	6.307	6	5 28 14.89	2.5367	22 27 21.0	1.199
7	3 26 4.92	2.6191	20 32 14.7	6.153	7	5 30 46.96	2.5323	22 26 4.6	1.346
8	3 28 42.09	2.6200	20 38 19.3	5.999	8	5 33 18.76	2.5277	22 24 39.5	1.491
9	3 31 19.32	2.6209	20 44 14.6	5.844	9	5 35 50.28	2.5231	22 23 5.7	1.636
10	3 33 56.60	2.6216	20 50 0.6	5.688	10	5 38 21.53	2.5185	22 21 23.2	1.781
11	3 36 33.91	2.6222	20 55 37.2	5.533	11	5 40 52.50	2.5138	22 19 32.0	1.924
12	3 39 11.26	2.6227	21 1 4.5	5.377	12	5 43 23.18	2.5089	22 17 32.3	2.066
13	3 41 48.63	2.6230	21 6 22.4	5.220	13	5 45 53.57	2.5040	22 15 24.1	2.208
14	3 44 26.02	2.6233	21 11 30.9	5.063	14	5 48 23.66	2.4990	22 13 7.4	2.348
15	3 47 3.43	2.6234	21 16 29.9	4.904	15	5 50 53.45	2.4940	22 10 42.4	2.487
16	3 49 40.83	2.6234	21 21 19.4	4.747	16	5 53 22.94	2.4889	22 8 9.0	2.626
17	3 52 18.24	2.6233	21 25 59.5	4.588	17	5 55 52.12	2.4837	22 5 27.3	2.763
18	3 54 55.63	2.6231	21 30 30.0	4.429	18	5 58 20.98	2.4783	22 2 37.4	2.899
19	3 57 33.01	2.6228	21 34 51.0	4.271	19	6 0 49.52	2.4730	21 59 39.4	3.034
20	4 0 10.36	2.6223	21 39 2.5	4.112	20	6 3 17.74	2.4677	21 56 33.3	3.168
21	4 2 47.68	2.6218	21 43 4.4	3.953	21	6 5 45.64	2.4623	21 53 19.2	3.303
22	4 5 24.97	2.6211	21 46 56.8	3.793	22	6 8 13.21	2.4567	21 49 57.0	3.435
23	4 8 2.21	2.6202	21 50 39.5	3.633	23	6 10 40.44	2.4511	21 46 27.0	3.565
24	4 10 39.39	2.6192	+21 54 12.7	+3.473	24	6 13 7.34	2.4455	+21 42 49.2	-3.695

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			
OCTOBER 24.									OCTOBER 26.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	
0	6	13	7.34	2.4435	+21	42	49.2	-3.695	0	8	3	28.96	2.1518	+16	38	19.2	
1	6	15	33.90	2.4398	21	39	3.6	3.823	1	8	5	37.89	2.1458	16	29	45.1	
2	6	18	0.11	2.4340	21	35	10.4	3.951	2	8	7	46.46	2.1400	16	21	6.6	
3	6	20	25.98	2.4282	21	31	9.5	4.078	3	8	9	54.69	2.1343	16	12	24.0	
4	6	22	51.49	2.4223	21	27	1.0	4.203	4	8	12	2.57	2.1285	16	3	37.2	
5	6	25	16.66	2.4166	21	22	45.1	4.327	5	8	14	10.11	2.1228	15	54	46.3	
6	6	27	41.48	2.4106	21	18	21.8	4.450	6	8	16	17.31	2.1172	15	45	51.3	
7	6	30	5.93	2.4046	21	13	51.1	4.573	7	8	18	24.17	2.1115	15	36	52.4	
8	6	32	30.03	2.3987	21	9	13.1	4.693	8	8	20	30.69	2.1059	15	27	49.6	
9	6	34	53.77	2.3927	21	4	28.0	4.812	9	8	22	36.88	2.1004	15	18	43.0	
10	6	37	17.15	2.3866	20	59	35.7	4.931	10	8	24	42.74	2.0949	15	9	32.6	
11	6	39	40.16	2.3804	20	54	36.3	5.048	11	8	26	48.27	2.0895	15	0	18.5	
12	6	42	2.80	2.3743	20	49	30.0	5.163	12	8	28	53.48	2.0841	14	51	0.7	
13	6	44	25.07	2.3682	20	44	16.8	5.278	13	8	30	58.36	2.0788	14	41	39.4	
14	6	46	46.98	2.3620	20	38	56.7	5.392	14	8	33	2.93	2.0734	14	32	14.5	
15	6	49	8.51	2.3558	20	33	29.8	5.503	15	8	35	7.17	2.0681	14	22	46.2	
16	6	51	29.67	2.3496	20	27	56.3	5.614	16	8	37	11.10	2.0630	14	13	14.5	
17	6	53	50.46	2.3433	20	22	16.1	5.725	17	8	39	14.73	2.0578	14	3	39.4	
18	6	56	10.87	2.3371	20	16	29.3	5.833	18	8	41	18.04	2.0527	13	54	1.0	
19	6	58	30.91	2.3308	20	10	36.1	5.940	19	8	43	21.05	2.0477	13	44	19.4	
20	7	0	50.57	2.3246	20	4	36.5	6.047	20	8	45	23.76	2.0426	13	34	34.7	
21	7	3	9.86	2.3183	19	58	30.5	6.153	21	8	47	26.16	2.0376	13	24	46.8	
22	7	5	28.76	2.3120	19	52	18.2	6.256	22	8	49	28.27	2.0328	13	14	55.9	
23	7	7	47.30	2.3058	+19	45	59.8	-6.358	23	8	51	30.09	2.0279	+13	5	2.0	
OCTOBER 25.									OCTOBER 27.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	
0	7	10	5.45	2.2993	+19	39	35.2	-6.460	0	8	53	31.62	2.0231	+12	55	5.1	
1	7	12	23.22	2.2931	19	33	4.6	6.539	1	8	55	32.86	2.0183	12	45	5.4	
2	7	14	40.62	2.2868	19	26	28.1	6.658	2	8	57	33.82	2.0137	12	35	2.8	
3	7	16	57.64	2.2805	19	19	45.6	6.756	3	8	59	34.50	2.0090	12	24	57.5	
4	7	19	14.28	2.2742	19	12	57.4	6.852	4	9	1	34.90	2.0044	12	14	49.4	
5	7	21	30.54	2.2679	19	6	3.4	6.948	5	9	3	35.03	1.9999	12	4	38.7	
6	7	23	46.43	2.2617	18	59	3.7	7.043	6	9	5	34.89	1.9955	11	54	25.4	
7	7	26	1.94	2.2554	18	51	58.3	7.135	7	9	7	34.49	1.9911	11	44	9.5	
8	7	28	17.08	2.2492	18	44	47.5	7.226	8	9	9	33.82	1.9867	11	33	51.1	
9	7	30	31.84	2.2428	18	37	31.2	7.317	9	9	11	32.89	1.9823	11	23	30.3	
10	7	32	46.22	2.2366	18	30	9.5	7.406	10	9	13	31.70	1.9781	11	13	7.0	
11	7	35	0.23	2.2304	18	22	42.5	7.494	11	9	15	30.26	1.9739	11	2	41.4	
12	7	37	13.87	2.2243	18	15	10.2	7.581	12	9	17	28.57	1.9698	10	52	13.5	
13	7	39	27.14	2.2180	18	7	32.8	7.667	13	9	19	26.63	1.9658	10	41	43.4	
14	7	41	40.03	2.2118	17	59	50.2	7.752	14	9	21	24.46	1.9618	10	31	11.1	
15	7	43	52.56	2.2058	17	52	2.6	7.834	15	9	23	22.04	1.9577	10	20	36.6	
16	7	46	4.72	2.1997	17	44	10.1	7.916	16	9	25	19.38	1.9538	10	10	0.0	
17	7	48	16.52	2.1936	17	36	12.7	7.998	17	9	27	16.50	1.9500	9	59	21.4	
18	7	50	27.95	2.1874	17	28	10.4	8.078	18	9	29	13.38	1.9463	9	48	40.8	
19	7	52	39.01	2.1814	17	20	3.4	8.157	19	9	31	10.05	1.9426	9	37	58.2	
20	7	54	49.72	2.1754	17	11	51.6	8.234	20	9	33	6.49	1.9388	9	27	13.8	
21	7	57	0.06	2.1694	17	3	35.3	8.310	21	9	35	2.71	1.9353	9	16	27.5	
22	7	59	10.05	2.1635	16	55	14.4	8.386	22	9	36	58.72	1.9318	9	5	39.3	
23	8	1	19.68	2.1576	16	46	49.0	8.460	23	9	38	54.52	1.9283	8	54	49.5	
24	8	3	28.96	2.1518	+16	38	19.2	-8.533	24	9	40	50.11	1.9248	+8	43	57.9	

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 28.					OCTOBER 30.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	9 40 50.11	1.9248	+8 43 57.9	-10.873	0	11 10 26.13	1.8314	-0 16 36.3	-11.391
1	9 42 45.50	1.9215	8 33 4.7	10.900	1	11 12 16.00	1.8309	0 27 59.6	11.385
2	9 44 40.69	1.9183	8 22 9.9	10.928	2	11 14 5.84	1.8304	0 39 22.5	11.379
3	9 46 35.68	1.9149	8 11 13.4	10.953	3	11 15 55.65	1.8300	0 50 45.1	11.373
4	9 48 30.48	1.9118	8 0 15.5	10.978	4	11 17 45.44	1.8298	1 2 7.2	11.365
5	9 50 25.09	1.9087	7 49 16.1	11.002	5	11 19 35.22	1.8294	1 13 28.9	11.358
6	9 52 19.52	1.9056	7 38 15.3	11.026	6	11 21 24.97	1.8292	1 24 50.1	11.349
7	9 54 13.78	1.9026	7 27 13.0	11.049	7	11 23 14.72	1.8291	1 36 10.8	11.341
8	9 56 7.83	1.8997	7 16 9.4	11.070	8	11 25 4.46	1.8289	1 47 31.0	11.331
9	9 58 1.72	1.8968	7 5 4.6	11.092	9	11 26 54.19	1.8288	1 58 50.5	11.320
10	9 59 55.44	1.8940	6 53 58.4	11.113	10	11 28 43.92	1.8288	2 10 9.4	11.309
11	10 1 49.00	1.8913	6 42 51.1	11.132	11	11 30 33.65	1.8288	2 21 27.6	11.298
12	10 3 42.39	1.8885	6 31 42.6	11.151	12	11 32 23.38	1.8289	2 32 45.1	11.285
13	10 5 35.62	1.8859	6 20 33.0	11.170	13	11 34 13.12	1.8291	2 44 1.8	11.273
14	10 7 28.70	1.8833	6 9 22.2	11.188	14	11 36 2.87	1.8293	2 55 17.8	11.260
15	10 9 21.62	1.8808	5 58 10.5	11.204	15	11 37 52.64	1.8296	3 6 33.0	11.245
16	10 11 14.39	1.8783	5 46 57.7	11.222	16	11 39 42.42	1.8298	3 17 47.2	11.230
17	10 13 7.02	1.8760	5 35 43.9	11.237	17	11 41 32.22	1.8302	3 29 0.6	11.216
18	10 14 59.51	1.8737	5 24 29.3	11.251	18	11 43 22.04	1.8306	3 40 13.1	11.199
19	10 16 51.86	1.8714	5 13 13.8	11.266	19	11 45 11.89	1.8311	3 51 24.5	11.183
20	10 18 44.08	1.8692	5 1 57.4	11.279	20	11 47 1.77	1.8316	4 2 35.0	11.166
21	10 20 36.16	1.8670	4 50 40.3	11.292	21	11 48 51.68	1.8322	4 13 44.4	11.148
22	10 22 28.12	1.8649	4 39 22.4	11.304	22	11 50 41.63	1.8328	4 24 52.7	11.130
23	10 24 19.95	1.8629	+4 28 3.8	-11.316	23	11 52 31.62	1.8335	-4 36 0.0	-11.111
OCTOBER 29.					OCTOBER 31.				
0	10 26 11.67	1.8610	+4 16 44.5	-11.327	0	11 54 21.65	1.8342	-4 47 6.0	-11.090
1	10 28 3.27	1.8591	4 5 24.6	11.337	1	11 56 11.72	1.8350	4 58 10.8	11.070
2	10 29 54.76	1.8572	3 54 4.1	11.346	2	11 58 1.85	1.8358	5 9 14.4	11.049
3	10 31 46.13	1.8553	3 42 43.1	11.355	3	11 59 52.02	1.8366	5 20 16.7	11.028
4	10 33 37.40	1.8537	3 31 21.5	11.363	4	12 1 42.24	1.8376	5 31 17.7	11.005
5	10 35 28.57	1.8521	3 19 59.5	11.370	5	12 3 32.53	1.8386	5 42 17.3	10.983
6	10 37 19.65	1.8504	3 8 37.1	11.378	6	12 5 22.87	1.8395	5 53 15.6	10.959
7	10 39 10.62	1.8488	2 57 14.2	11.384	7	12 7 13.27	1.8406	6 4 12.4	10.934
8	10 41 1.51	1.8474	2 45 51.0	11.389	8	12 9 3.74	1.8418	6 15 7.7	10.909
9	10 42 52.31	1.8459	2 34 27.5	11.394	9	12 10 54.28	1.8429	6 26 1.5	10.884
10	10 44 43.02	1.8445	2 23 3.7	11.398	10	12 12 44.89	1.8441	6 36 53.8	10.858
11	10 46 33.65	1.8433	2 11 39.7	11.402	11	12 14 35.57	1.8453	6 47 44.5	10.832
12	10 48 24.21	1.8420	2 0 15.5	11.405	12	12 16 26.33	1.8467	6 58 33.6	10.804
13	10 50 14.69	1.8408	1 48 51.1	11.407	13	12 18 17.17	1.8480	7 9 21.0	10.776
14	10 52 5.11	1.8397	1 37 26.7	11.408	14	12 20 8.09	1.8494	7 20 6.7	10.748
15	10 53 55.45	1.8385	1 26 2.1	11.410	15	12 21 59.10	1.8508	7 30 50.7	10.718
16	10 55 45.73	1.8375	1 14 37.5	11.410	16	12 23 50.19	1.8523	7 41 32.9	10.688
17	10 57 35.95	1.8366	1 3 12.9	11.410	17	12 25 41.37	1.8538	7 52 13.2	10.657
18	10 59 26.12	1.8357	0 51 48.3	11.409	18	12 27 32.65	1.8554	8 2 51.7	10.625
19	11 1 16.23	1.8348	0 40 23.8	11.408	19	12 29 24.02	1.8570	8 13 28.3	10.593
20	11 3 6.30	1.8341	0 28 59.4	11.406	20	12 31 15.49	1.8588	8 24 3.0	10.562
21	11 4 56.32	1.8333	0 17 35.1	11.403	21	12 33 7.07	1.8604	8 34 35.7	10.528
22	11 6 46.29	1.8326	+0 6 11.1	11.398	22	12 34 58.74	1.8622	8 45 6.4	10.494
23	11 8 36.23	1.8320	-0 5 12.7	11.395	23	12 36 50.53	1.8640	8 55 35.0	10.459
24	11 10 26.13	1.8314	-0 16 36.3	-11.391	24	12 38 42.42	1.8658	-9 6 1.5	-10.424

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	
NOVEMBER 1.							NOVEMBER 3.						
	h	m	s	s	"	"		h	m	s	s	"	"
0	12	38	42.42	1.8658	- 9 6 1.5	-10.424	0	14	11	3.58	1.9933	-16 32 41.4	
1	12	40	34.42	1.8677	9 16 25.9	10.388	1	14	13	3.27	1.9965	16 40 34.3	
2	12	42	26.54	1.8697	9 26 48.1	10.352	2	14	15	3.16	1.9998	16 48 23.0	
3	12	44	18.78	1.8716	9 37 8.1	10.314	3	14	17	3.24	2.0030	16 56 7.5	
4	12	46	11.13	1.8735	9 47 25.8	10.276	4	14	19	3.52	2.0063	17 3 47.6	
5	12	48	3.60	1.8756	9 57 41.2	10.238	5	14	21	3.99	2.0095	17 11 23.4	
6	12	49	56.20	1.8777	10 7 54.3	10.198	6	14	23	4.66	2.0128	17 18 54.9	
7	12	51	48.92	1.8798	10 18 5.0	10.158	7	14	25	5.52	2.0160	17 26 21.9	
8	12	53	41.77	1.8820	10 28 13.3	10.118	8	14	27	6.58	2.0193	17 33 44.5	
9	12	55	34.76	1.8842	10 38 19.2	10.077	9	14	29	7.83	2.0225	17 41 2.6	
10	12	57	27.87	1.8863	10 48 22.5	10.034	10	14	31	9.28	2.0258	17 48 16.1	
11	12	59	21.12	1.8886	10 58 23.3	9.992	11	14	33	10.93	2.0292	17 55 25.1	
12	13	1	14.50	1.8908	11 8 21.5	9.948	12	14	35	12.78	2.0325	18 2 29.4	
13	13	3	8.02	1.8933	11 18 17.1	9.904	13	14	37	14.83	2.0358	18 9 29.1	
14	13	5	1.69	1.8957	11 28 10.0	9.859	14	14	39	17.07	2.0390	18 16 24.0	
15	13	6	55.50	1.8981	11 38 0.2	9.814	15	14	41	19.51	2.0423	18 23 14.2	
16	13	8	49.46	1.9005	11 47 47.7	9.768	16	14	43	22.15	2.0457	18 29 59.6	
17	13	10	43.56	1.9029	11 57 32.3	9.721	17	14	45	24.99	2.0490	18 36 40.1	
18	13	12	37.81	1.9055	12 7 14.2	9.673	18	14	47	28.03	2.0523	18 43 15.8	
19	13	14	32.22	1.9080	12 16 53.1	9.624	19	14	49	31.26	2.0556	18 49 46.5	
20	13	16	26.77	1.9106	12 26 29.1	9.576	20	14	51	34.70	2.0588	18 56 12.3	
21	13	18	21.49	1.9133	12 36 2.2	9.527	21	14	53	38.32	2.0621	19 2 33.1	
22	13	20	16.36	1.9158	12 45 32.3	9.477	22	14	55	42.15	2.0654	19 8 48.8	
23	13	22	11.39	1.9185	-12 54 59.4	- 9.425	23	14	57	46.17	2.0687	-19 14 59.5	
NOVEMBER 2.							NOVEMBER 4.						
0	13	24	6.58	1.9212	-13 4 23.3	- 9.373	0	14	59	50.39	2.0719	-19 21 5.0	
1	13	26	1.93	1.9239	13 13 44.1	9.321	1	15	1	54.80	2.0752	19 27 5.4	
2	13	27	57.45	1.9268	13 23 1.8	9.268	2	15	3	59.41	2.0784	19 33 0.5	
3	13	29	53.14	1.9295	13 32 16.2	9.213	3	15	6	4.21	2.0816	19 38 50.4	
4	13	31	48.99	1.9323	13 41 27.4	9.158	4	15	8	9.20	2.0848	19 44 35.1	
5	13	33	45.02	1.9352	13 50 35.2	9.103	5	15	10	14.38	2.0880	19 50 14.4	
6	13	35	41.21	1.9380	13 59 39.8	9.048	6	15	12	19.76	2.0913	19 55 48.3	
7	13	37	37.58	1.9409	14 8 40.9	8.991	7	15	14	25.33	2.0943	20 1 16.9	
8	13	39	34.12	1.9438	14 17 38.7	8.933	8	15	16	31.08	2.0975	20 6 40.0	
9	13	41	30.84	1.9468	14 26 32.9	8.875	9	15	18	37.03	2.1007	20 11 57.6	
10	13	43	27.73	1.9498	14 35 23.7	8.817	10	15	20	43.16	2.1038	20 17 9.7	
11	13	45	24.81	1.9528	14 44 10.9	8.757	11	15	22	49.48	2.1068	20 22 16.3	
12	13	47	22.06	1.9558	14 52 54.5	8.697	12	15	24	55.98	2.1099	20 27 17.2	
13	13	49	19.50	1.9588	15 1 34.5	8.635	13	15	27	2.67	2.1129	20 32 12.5	
14	13	51	17.12	1.9618	15 10 10.7	8.573	14	15	29	9.53	2.1159	20 37 2.2	
15	13	53	14.92	1.9649	15 18 43.3	8.512	15	15	31	16.58	2.1190	20 41 46.1	
16	13	55	12.91	1.9680	15 27 12.1	8.448	16	15	33	23.81	2.1220	20 46 24.3	
17	13	57	11.08	1.9711	15 35 37.1	8.384	17	15	35	31.22	2.1249	20 50 56.8	
18	13	59	9.44	1.9743	15 43 58.2	8.319	18	15	37	38.80	2.1278	20 55 23.4	
19	14	1	7.99	1.9774	15 52 15.4	8.254	19	15	39	46.56	2.1308	20 59 44.2	
20	14	3	6.73	1.9805	16 0 28.7	8.188	20	15	41	54.49	2.1336	21 3 59.1	
21	14	5	5.65	1.9837	16 8 37.9	8.121	21	15	44	2.59	2.1364	21 8 8.2	
22	14	7	4.77	1.9869	16 16 43.2	8.054	22	15	46	10.86	2.1393	21 12 11.2	
23	14	9	4.08	1.9901	16 24 44.4	7.985	23	15	48	19.30	2.1421	21 16 8.3	
24	14	11	3.58	1.9933	-16 32 41.4	- 7.916	24	15	50	27.91	2.1448	-21 19 59.4	

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 5.					NOVEMBER 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 50 27.91	2.1448	-21 19 59.4	-3.802	0	17 35 50.21	2.2280	-22 18 35.1	+1.478
1	15 52 36.68	2.1476	21 23 44.5	3.700	1	17 38 3.91	2.2286	22 17 3.0	1.592
2	15 54 45.62	2.1503	21 27 23.4	3.598	2	17 40 17.64	2.2291	22 15 24.1	1.707
3	15 56 54.71	2.1529	21 30 56.3	3.497	3	17 42 31.40	2.2296	22 13 38.2	1.823
4	15 59 3.97	2.1556	21 34 23.0	3.394	4	17 44 45.19	2.2300	22 11 45.4	1.938
5	16 1 13.38	2.1581	21 37 43.6	3.291	5	17 46 59.00	2.2303	22 9 45.7	2.053
6	16 3 22.94	2.1607	21 40 57.9	3.188	6	17 49 12.83	2.2306	22 7 39.1	2.168
7	16 5 32.66	2.1633	21 44 6.1	3.084	7	17 51 26.67	2.2308	22 5 25.5	2.283
8	16 7 42.53	2.1657	21 47 8.0	2.979	8	17 53 40.53	2.2312	22 3 5.1	2.398
9	16 9 52.54	2.1681	21 50 3.6	2.874	9	17 55 54.41	2.2313	22 0 37.8	2.513
10	16 12 2.70	2.1705	21 52 52.9	2.768	10	17 58 8.29	2.2314	21 58 3.5	2.629
11	16 14 13.00	2.1728	21 55 35.8	2.663	11	18 0 22.18	2.2315	21 55 22.3	2.743
12	16 16 23.44	2.1752	21 58 12.4	2.557	12	18 2 36.07	2.2315	21 52 34.3	2.858
13	16 18 34.02	2.1775	22 0 42.6	2.450	13	18 4 49.96	2.2315	21 49 39.4	2.973
14	16 20 44.74	2.1798	22 3 6.4	2.343	14	18 7 3.85	2.2315	21 46 37.5	3.088
15	16 22 55.59	2.1819	22 5 23.7	2.235	15	18 9 17.74	2.2314	21 43 28.8	3.202
16	16 25 6.57	2.1841	22 7 34.6	2.128	16	18 11 31.62	2.2313	21 40 13.3	3.316
17	16 27 17.68	2.1862	22 9 39.0	2.018	17	18 13 45.49	2.2310	21 36 50.9	3.431
18	16 29 28.91	2.1883	22 11 36.8	1.910	18	18 15 59.34	2.2308	21 33 21.6	3.545
19	16 31 40.27	2.1903	22 13 28.2	1.802	19	18 18 13.18	2.2306	21 29 45.5	3.658
20	16 33 51.75	2.1923	22 15 13.0	1.692	20	18 20 27.01	2.2303	21 26 2.6	3.773
21	16 36 3.34	2.1941	22 16 51.2	1.582	21	18 22 40.81	2.2299	21 22 12.8	3.887
22	16 38 15.04	2.1960	22 18 22.8	1.472	22	18 24 54.60	2.2296	21 18 16.2	3.999
23	16 40 26.86	2.1979	-22 19 47.8	-1.361	23	18 27 8.36	2.2291	-21 14 12.9	+4.112
NOVEMBER 6.					NOVEMBER 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 42 38.79	2.1998	-22 21 6.1	-1.250	0	18 29 22.09	2.2287	-21 10 2.8	+4.225
1	16 44 50.83	2.2015	22 22 17.8	1.139	1	18 31 35.80	2.2282	21 5 45.9	4.338
2	16 47 2.97	2.2032	22 23 22.8	1.028	2	18 33 49.47	2.2276	21 1 22.3	4.450
3	16 49 15.21	2.2048	22 24 21.2	0.917	3	18 36 3.11	2.2271	20 56 51.9	4.562
4	16 51 27.54	2.2064	22 25 12.8	0.804	4	18 38 16.72	2.2265	20 52 14.9	4.673
5	16 53 39.98	2.2080	22 25 57.7	0.692	5	18 40 30.29	2.2258	20 47 31.1	4.786
6	16 55 52.50	2.2094	22 26 35.8	0.579	6	18 42 43.82	2.2252	20 42 40.6	4.897
7	16 58 5.11	2.2109	22 27 7.2	0.467	7	18 44 57.31	2.2245	20 37 43.5	5.008
8	17 0 17.81	2.2123	22 27 31.8	0.353	8	18 47 10.76	2.2238	20 32 39.7	5.119
9	17 2 30.59	2.2137	22 27 49.6	0.240	9	18 49 24.16	2.2230	20 27 29.2	5.229
10	17 4 43.45	2.2150	22 28 0.6	0.127	10	18 51 37.52	2.2223	20 22 12.2	5.338
11	17 6 56.39	2.2163	22 28 4.8	-0.013	11	18 53 50.84	2.2215	20 16 48.6	5.448
12	17 9 9.40	2.2175	22 28 2.2	+0.100	12	18 56 4.10	2.2206	20 11 18.4	5.558
13	17 11 22.49	2.2187	22 27 52.8	0.215	13	18 58 17.31	2.2198	20 5 41.7	5.667
14	17 13 35.64	2.2197	22 27 36.4	0.329	14	19 0 30.47	2.2188	19 59 58.4	5.776
15	17 15 48.85	2.2208	22 27 13.3	0.443	15	19 2 43.57	2.2179	19 54 8.6	5.883
16	17 18 2.13	2.2218	22 26 43.3	0.558	16	19 4 56.62	2.2171	19 48 12.4	5.992
17	17 20 15.47	2.2228	22 26 6.4	0.673	17	19 7 9.62	2.2161	19 42 9.6	6.099
18	17 22 28.86	2.2236	22 25 22.6	0.788	18	19 9 22.55	2.2151	19 36 0.5	6.205
19	17 24 42.30	2.2245	22 24 31.9	0.902	19	19 11 35.43	2.2141	19 29 45.0	6.313
20	17 26 55.80	2.2253	22 23 34.4	1.017	20	19 13 48.24	2.2130	19 23 23.0	6.419
21	17 29 9.34	2.2260	22 22 29.9	1.133	21	19 16 0.99	2.2121	19 16 54.7	6.524
22	17 31 22.92	2.2268	22 21 18.5	1.247	22	19 18 13.69	2.2111	19 10 20.1	6.629
23	17 33 36.55	2.2274	22 20 0.3	1.362	23	19 20 26.32	2.2099	19 3 39.2	6.736
24	17 35 50.21	2.2280	-22 18 35.1	+1.478	24	19 22 38.88	2.2088	-18 56 52.0	+6.838

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	
NOVEMBER 9.							NOVEMBER 11.						
	h	m	s	s	"	"		h	m	s	s	"	"
0	19	22	38.88	2.2088	-18 56 52.0	+ 6.838	0	21	7	25.24	2.1616	-11 39 0.5	
1	19	24	51.38	2.2078	18 49 58.6	6.943	1	21	9	34.92	2.1611	11 27 49.1	
2	19	27	3.81	2.2067	18 42 58.9	7.047	2	21	11	44.57	2.1606	11 16 33.3	
3	19	29	16.18	2.2055	18 35 53.0	7.149	3	21	13	54.19	2.1602	11 5 13.2	
4	19	31	28.47	2.2044	18 28 41.0	7.252	4	21	16	3.79	2.1599	10 53 49.0	
5	19	33	40.71	2.2033	18 21 22.8	7.354	5	21	18	13.38	2.1596	10 42 20.5	
6	19	35	52.87	2.2021	18 13 58.5	7.455	6	21	20	22.94	2.1593	10 30 48.0	
7	19	38	4.96	2.2010	18 6 28.2	7.556	7	21	22	32.49	2.1590	10 19 11.3	
8	19	40	16.99	2.1998	17 58 51.8	7.656	8	21	24	42.02	2.1588	10 7 30.7	
9	19	42	28.94	2.1987	17 51 9.5	7.756	9	21	26	51.55	2.1587	9 55 46.0	
10	19	44	40.83	2.1976	17 43 21.1	7.856	10	21	29	1.06	2.1585	9 43 57.5	
11	19	46	52.65	2.1963	17 35 26.8	7.954	11	21	31	10.57	2.1585	9 32 5.1	
12	19	49	4.39	2.1952	17 27 26.6	8.053	12	21	33	20.08	2.1585	9 20 8.9	
13	19	51	16.07	2.1941	17 19 20.5	8.150	13	21	35	29.59	2.1585	9 8 9.0	
14	19	53	27.68	2.1929	17 11 8.6	8.247	14	21	37	39.10	2.1585	8 56 5.3	
15	19	55	39.22	2.1918	17 2 50.9	8.343	15	21	39	48.61	2.1587	8 43 58.1	
16	19	57	50.69	2.1906	16 54 27.4	8.439	16	21	41	58.14	2.1588	8 31 47.2	
17	20	0	2.09	2.1894	16 45 58.2	8.534	17	21	44	7.67	2.1590	8 19 32.8	
18	20	2	13.42	2.1883	16 37 23.3	8.630	18	21	46	17.22	2.1593	8 7 14.9	
19	20	4	24.68	2.1871	16 28 42.6	8.724	19	21	48	26.79	2.1596	7 54 53.7	
20	20	6	35.87	2.1860	16 19 56.4	8.817	20	21	50	36.37	2.1599	7 42 29.1	
21	20	8	47.00	2.1848	16 11 4.6	8.910	21	21	52	45.98	2.1603	7 30 1.1	
22	20	10	58.05	2.1838	16 2 7.2	9.002	22	21	54	55.61	2.1608	7 17 30.0	
23	20	13	9.05	2.1827	-15 53 4.4	+ 9.094	23	21	57	5.28	2.1613	- 7 4 55.7	
NOVEMBER 10.							NOVEMBER 12.						
0	20	15	19.97	2.1815	-15 43 55.9	+ 9.186	0	21	59	14.97	2.1618	- 6 52 18.2	
1	20	17	30.83	2.1805	15 34 42.1	9.275	1	22	1	24.70	2.1625	6 39 37.7	
2	20	19	41.63	2.1794	15 25 22.9	9.365	2	22	3	34.47	2.1632	6 26 54.2	
3	20	21	52.36	2.1783	15 15 58.3	9.453	3	22	5	44.28	2.1639	6 14 7.8	
4	20	24	3.03	2.1773	15 6 28.5	9.542	4	22	7	54.14	2.1647	6 1 18.5	
5	20	26	13.64	2.1763	14 56 53.3	9.630	5	22	10	4.04	2.1655	5 48 26.4	
6	20	28	24.18	2.1753	14 47 12.9	9.717	6	22	12	14.00	2.1664	5 35 31.6	
7	20	30	34.67	2.1743	14 37 27.3	9.803	7	22	14	24.01	2.1673	5 22 34.0	
8	20	32	45.10	2.1733	14 27 36.6	9.888	8	22	16	34.08	2.1683	5 9 33.9	
9	20	34	55.47	2.1724	14 17 40.7	9.973	9	22	18	44.21	2.1693	4 56 31.1	
10	20	37	5.79	2.1715	14 7 39.9	10.057	10	22	20	54.40	2.1704	4 43 25.9	
11	20	39	16.05	2.1706	13 57 33.9	10.141	11	22	23	4.66	2.1717	4 30 18.3	
12	20	41	26.26	2.1698	13 47 23.0	10.223	12	22	25	15.00	2.1729	4 17 8.3	
13	20	43	36.42	2.1688	13 37 7.2	10.304	13	22	27	25.41	2.1742	4 3 56.0	
14	20	45	46.52	2.1680	13 26 46.5	10.386	14	22	29	35.90	2.1755	3 50 41.5	
15	20	47	56.58	2.1673	13 16 20.9	10.467	15	22	31	46.47	2.1769	3 37 24.9	
16	20	50	6.60	2.1666	13 5 50.5	10.546	16	22	33	57.13	2.1783	3 24 6.1	
17	20	52	16.57	2.1658	12 55 15.4	10.624	17	22	36	7.87	2.1798	3 10 45.4	
18	20	54	26.49	2.1650	12 44 35.6	10.703	18	22	38	18.71	2.1815	2 57 22.7	
19	20	56	36.37	2.1644	12 33 51.1	10.779	19	22	40	29.65	2.1831	2 43 58.1	
20	20	58	46.22	2.1638	12 23 2.1	10.856	20	22	42	40.68	2.1848	2 30 31.7	
21	21	0	56.03	2.1632	12 12 8.4	10.933	21	22	44	51.82	2.1866	2 17 3.6	
22	21	3	5.80	2.1625	12 1 10.2	11.007	22	22	47	3.07	2.1883	2 3 33.9	
23	21	5	15.53	2.1620	11 50 7.6	11.081	23	22	49	14.42	2.1902	1 50 2.5	
24	21	7	25.24	2.1616	-11 39 0.5	+11.154	24	22	51	25.89	2.1922	- 1 36 29.7	

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 13.					NOVEMBER 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	22 51 25.89	2.1922	-1 36 29.7	+13.559	0	0 40 0.97	2.3534	+ 9 16 23.3	+13.061
1	22 53 37.48	2.1942	1 22 55.4	13.583	1	0 42 22.31	2.3580	9 29 25.5	13.012
2	22 55 49.19	2.1962	1 9 19.8	13.604	2	0 44 43.93	2.3627	9 42 24.7	12.961
3	22 58 1.02	2.1983	0 55 42.9	13.625	3	0 47 5.83	2.3673	9 55 20.8	12.908
4	23 0 12.99	2.2005	0 42 4.8	13.644	4	0 49 28.00	2.3719	10 8 13.6	12.853
5	23 2 25.08	2.2028	0 28 25.6	13.663	5	0 51 50.46	2.3767	10 21 3.1	12.796
6	23 4 37.32	2.2051	0 14 45.3	13.679	6	0 54 13.20	2.3813	10 33 49.1	12.738
7	23 6 49.69	2.2074	-0 1 4.1	13.695	7	0 56 36.22	2.3861	10 46 31.6	12.678
8	23 9 2.21	2.2098	+0 12 38.1	13.710	8	0 58 59.53	2.3909	10 59 10.4	12.616
9	23 11 14.87	2.2123	0 26 21.1	13.723	9	1 1 23.13	2.3957	11 11 45.5	12.553
10	23 13 27.68	2.2148	0 40 4.8	13.734	10	1 3 47.01	2.4005	11 24 16.7	12.487
11	23 15 40.65	2.2175	0 53 49.2	13.744	11	1 6 11.19	2.4053	11 36 43.9	12.419
12	23 17 53.78	2.2202	1 7 34.1	13.753	12	1 8 35.65	2.4102	11 49 7.0	12.350
13	23 20 7.07	2.2228	1 21 19.5	13.760	13	1 11 0.41	2.4151	12 1 25.9	12.279
14	23 22 20.52	2.2257	1 35 5.3	13.767	14	1 13 25.46	2.4200	12 13 40.5	12.207
15	23 24 34.15	2.2285	1 48 51.5	13.772	15	1 15 50.81	2.4249	12 25 50.7	12.133
16	23 26 47.94	2.2314	2 2 37.9	13.774	16	1 18 16.45	2.4298	12 37 56.4	12.056
17	23 29 1.92	2.2344	2 16 24.4	13.776	17	1 20 42.38	2.4347	12 49 57.4	11.978
18	23 31 16.07	2.2373	2 30 11.0	13.777	18	1 23 8.61	2.4397	13 1 53.7	11.898
19	23 33 30.40	2.2405	2 43 57.6	13.776	19	1 25 35.14	2.4447	13 13 45.1	11.816
20	23 35 44.93	2.2437	2 57 44.1	13.773	20	1 28 1.97	2.4496	13 25 31.6	11.733
21	23 37 59.64	2.2468	3 11 30.3	13.768	21	1 30 29.09	2.4544	13 37 13.1	11.648
22	23 40 14.55	2.2501	3 25 16.3	13.763	22	1 32 56.50	2.4593	13 48 49.4	11.561
23	23 42 29.65	2.2534	+3 39 1.9	+13.756	23	1 35 24.21	2.4643	+14 0 20.4	+11.472
NOVEMBER 14.					NOVEMBER 16.				
0	23 44 44.96	2.2568	+3 52 47.0	+13.748	0	1 37 52.22	2.4693	+14 11 46.0	+11.382
1	23 47 0.47	2.2603	4 6 31.6	13.738	1	1 40 20.53	2.4743	14 23 6.2	11.289
2	23 49 16.19	2.2638	4 20 15.5	13.725	2	1 42 49.13	2.4791	14 34 20.7	11.195
3	23 51 32.12	2.2673	4 33 58.6	13.712	3	1 45 18.02	2.4839	14 45 29.6	11.099
4	23 53 48.26	2.2709	4 47 40.9	13.698	4	1 47 47.20	2.4888	14 56 32.6	11.002
5	23 56 4.63	2.2746	5 1 22.3	13.682	5	1 50 16.68	2.4938	15 7 29.8	10.903
6	23 58 21.21	2.2783	5 15 2.7	13.664	6	1 52 46.45	2.4986	15 18 20.9	10.801
7	0 0 38.02	2.2820	5 28 42.0	13.644	7	1 55 16.51	2.5034	15 29 5.9	10.698
8	0 2 55.05	2.2858	5 42 20.0	13.623	8	1 57 46.86	2.5083	15 39 44.7	10.594
9	0 5 12.32	2.2898	5 55 56.7	13.601	9	2 0 17.50	2.5130	15 50 17.2	10.488
10	0 7 29.82	2.2937	6 9 32.1	13.577	10	2 2 48.42	2.5177	16 0 43.3	10.381
11	0 9 47.56	2.2977	6 23 5.9	13.550	11	2 5 19.62	2.5223	16 11 2.9	10.271
12	0 12 5.54	2.3017	6 36 38.1	13.523	12	2 7 51.10	2.5270	16 21 15.8	10.159
13	0 14 23.76	2.3057	6 50 8.6	13.493	13	2 10 22.86	2.5317	16 31 22.0	10.047
14	0 16 42.22	2.3098	7 3 37.3	13.463	14	2 12 54.90	2.5363	16 41 21.4	9.932
15	0 19 0.93	2.3140	7 17 4.1	13.431	15	2 15 27.21	2.5408	16 51 13.8	9.816
16	0 21 19.90	2.3183	7 30 29.0	13.397	16	2 17 59.79	2.5453	17 0 59.3	9.698
17	0 23 39.12	2.3224	7 43 51.7	13.360	17	2 20 32.64	2.5497	17 10 37.6	9.578
18	0 25 58.59	2.3267	7 57 12.2	13.323	18	2 23 5.75	2.5541	17 20 8.7	9.458
19	0 28 18.32	2.3311	8 10 30.4	13.283	19	2 25 39.13	2.5584	17 29 32.5	9.335
20	0 30 38.32	2.3355	8 23 46.2	13.243	20	2 28 12.76	2.5626	17 38 48.9	9.211
21	0 32 58.58	2.3399	8 36 59.5	13.200	21	2 30 46.64	2.5668	17 47 57.8	9.086
22	0 35 19.11	2.3443	8 50 10.2	13.156	22	2 33 20.78	2.5710	17 56 59.2	8.959
23	0 37 39.90	2.3488	9 3 18.2	13.109	23	2 35 55.16	2.5751	18 5 52.9	8.830
24	0 40 0.97	2.3534	+9 16 23.3	+13.061	24	2 38 29.79	2.5792	+18 14 38.8	+8.700

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
NOVEMBER 17.									NOVEMBER 19.								
	h	m	s	s	°	'	''	'''		h	m	s	s	°	'	''	'''
0	2	38	29.79	2.5792	+18	14	38.8	+8.700	0	4	45	3.15	2.6473	+22	21	39.4	+1.329
1	2	41	4.66	2.5831	18	23	16.9	8.569	1	4	47	41.94	2.6455	22	22	54.3	1.167
2	2	43	39.76	2.5869	18	31	47.1	8.436	2	4	50	20.61	2.6435	22	23	59.4	1.004
3	2	46	15.09	2.5908	18	40	9.2	8.302	3	4	52	59.16	2.6414	22	24	54.8	0.843
4	2	48	50.65	2.5944	18	48	23.3	8.166	4	4	55	37.58	2.6393	22	25	40.5	0.681
5	2	51	26.42	2.5981	18	56	29.1	8.029	5	4	58	15.87	2.6369	22	26	16.5	0.519
6	2	54	2.42	2.6017	19	4	26.8	7.892	6	5	0	54.01	2.6344	22	26	42.8	0.358
7	2	56	38.62	2.6051	19	12	16.1	7.751	7	5	3	32.00	2.6318	22	26	59.5	0.198
8	2	59	15.03	2.6085	19	19	56.9	7.611	8	5	6	9.82	2.6290	22	27	6.6	+0.038
9	3	1	51.64	2.6118	19	27	29.4	7.469	9	5	8	47.48	2.6263	22	27	4.0	-0.122
10	3	4	28.45	2.6150	19	34	53.2	7.326	10	5	11	24.97	2.6232	22	26	52.0	0.281
11	3	7	5.44	2.6181	19	42	8.5	7.182	11	5	14	2.26	2.6200	22	26	30.3	0.440
12	3	9	42.62	2.6211	19	49	15.0	7.036	12	5	16	39.37	2.6168	22	25	59.2	0.598
13	3	12	19.97	2.6239	19	56	12.8	6.889	13	5	19	16.28	2.6134	22	25	18.6	0.755
14	3	14	57.49	2.6268	20	3	1.7	6.742	14	5	21	52.98	2.6098	22	24	28.6	0.911
15	3	17	35.18	2.6295	20	9	41.8	6.593	15	5	24	29.46	2.6062	22	23	29.3	1.067
16	3	20	13.03	2.6320	20	16	12.9	6.443	16	5	27	5.72	2.6024	22	22	20.6	1.223
17	3	22	51.02	2.6344	20	22	34.9	6.292	17	5	29	41.75	2.5985	22	21	2.6	1.377
18	3	25	29.16	2.6368	20	28	47.9	6.141	18	5	32	17.54	2.5945	22	19	35.4	1.530
19	3	28	7.44	2.6391	20	34	51.8	5.988	19	5	34	53.09	2.5904	22	17	59.0	1.683
20	3	30	45.85	2.6412	20	40	46.5	5.834	20	5	37	28.39	2.5863	22	16	13.5	1.834
21	3	33	24.38	2.6432	20	46	31.9	5.680	21	5	40	3.44	2.5819	22	14	18.9	1.986
22	3	36	3.03	2.6451	20	52	8.1	5.525	22	5	42	38.22	2.5774	22	12	15.2	2.136
23	3	38	41.79	2.6468	+20	57	34.9	+5.369	23	5	45	12.73	2.5728	+22	10	2.6	-2.284
NOVEMBER 18.									NOVEMBER 20.								
0	3	41	20.65	2.6485	+21	2	52.4	+5.213	0	5	47	46.96	2.5682	+22	7	41.1	-2.433
1	3	43	59.61	2.6500	21	8	0.4	5.055	1	5	50	20.91	2.5634	22	5	10.7	2.580
2	3	46	38.65	2.6513	21	12	59.0	4.898	2	5	52	54.57	2.5585	22	2	31.5	2.726
3	3	49	17.77	2.6526	21	17	48.1	4.738	3	5	55	27.93	2.5535	21	59	43.6	2.871
4	3	51	56.96	2.6537	21	22	27.6	4.579	4	5	58	0.99	2.5485	21	56	47.0	3.015
5	3	54	36.21	2.6547	21	26	57.6	4.419	5	6	0	33.75	2.5433	21	53	41.8	3.158
6	3	57	15.52	2.6555	21	31	17.9	4.259	6	6	3	6.19	2.5381	21	50	28.0	3.301
7	3	59	54.87	2.6563	21	35	28.7	4.098	7	6	5	38.32	2.5328	21	47	5.7	3.441
8	4	2	34.27	2.6568	21	39	29.7	3.937	8	6	8	10.13	2.5274	21	43	35.1	3.580
9	4	5	13.69	2.6573	21	43	21.1	3.776	9	6	10	41.61	2.5218	21	39	56.1	3.719
10	4	7	53.14	2.6577	21	47	2.8	3.613	10	6	13	12.75	2.5163	21	36	8.8	3.858
11	4	10	32.61	2.6578	21	50	34.7	3.451	11	6	15	43.56	2.5107	21	32	13.2	3.993
12	4	13	12.08	2.6578	21	53	56.9	3.288	12	6	18	14.03	2.5049	21	28	9.6	4.128
13	4	15	51.55	2.6578	21	57	9.3	3.126	13	6	20	44.15	2.4991	21	23	57.9	4.262
14	4	18	31.01	2.6575	22	0	12.0	2.963	14	6	23	13.92	2.4933	21	19	38.2	4.394
15	4	21	10.45	2.6571	22	3	4.8	2.799	15	6	25	43.34	2.4873	21	15	10.6	4.525
16	4	23	49.86	2.6565	22	5	47.9	2.637	16	6	28	12.39	2.4813	21	10	35.2	4.655
17	4	26	29.23	2.6558	22	8	21.2	2.473	17	6	30	41.09	2.4753	21	5	52.0	4.784
18	4	29	8.56	2.6551	22	10	44.6	2.309	18	6	33	9.42	2.4691	21	1	1.1	4.912
19	4	31	47.84	2.6542	22	12	58.3	2.146	19	6	35	37.38	2.4629	20	56	2.6	5.038
20	4	34	27.06	2.6531	22	15	2.1	1.982	20	6	38	4.97	2.4568	20	50	56.5	5.163
21	4	37	6.21	2.6518	22	16	56.1	1.819	21	6	40	32.19	2.4504	20	45	43.0	5.286
22	4	39	45.28	2.6504	22	18	40.4	1.656	22	6	42	59.02	2.4441	20	40	22.2	5.408
23	4	42	24.26	2.6489	22	20	14.8	1.492	23	6	45	25.48	2.4378	20	34	54.0	5.530
24	4	45	3.15	2.6473	+22	21	39.4	+1.329	24	6	47	51.55	2.4313	+20	29	18.6	-5.646

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.		
NOVEMBER 21.							NOVEMBER 23.								
	h	m	s	s	"	"		h	m	s	s	"	"		
0	6	47	51.55	2.4313	+20 29	18.6	-5.649	0	8	36	55.57	2.1181	+14 6	9.4	-9.808
1	6	50	17.23	2.4248	20 23	36.1	5.768	1	8	39	2.48	2.1123	13 56	19.2	9.864
2	6	52	42.53	2.4183	20 17	46.5	5.884	2	8	41	9.04	2.1064	13 46	25.7	9.918
3	6	55	7.43	2.4118	20 11	50.0	5.999	3	8	43	15.25	2.1006	13 36	29.0	9.973
4	6	57	31.94	2.4053	20 5	46.6	6.114	4	8	45	21.11	2.0949	13 26	29.1	10.024
5	6	59	56.06	2.3987	19 59	36.3	6.227	5	8	47	26.64	2.0893	13 16	26.1	10.075
6	7	2	19.78	2.3920	19 53	19.4	6.338	6	8	49	31.83	2.0837	13 6	20.1	10.125
7	7	4	43.10	2.3853	19 46	55.8	6.448	7	8	51	36.68	2.0780	12 56	11.1	10.174
8	7	7	6.02	2.3787	19 40	25.6	6.557	8	8	53	41.19	2.0725	12 45	59.2	10.223
9	7	9	28.54	2.3720	19 33	49.0	6.664	9	8	55	45.38	2.0672	12 35	44.4	10.269
10	7	11	50.66	2.3653	19 27	5.9	6.771	10	8	57	43.25	2.0618	12 25	26.9	10.315
11	7	14	12.38	2.3586	19 20	16.5	6.875	11	8	59	52.79	2.0563	12 15	6.6	10.360
12	7	16	33.69	2.3518	19 13	20.9	6.978	12	9	1	56.01	2.0511	12 4	43.7	10.403
13	7	18	54.60	2.3451	19 6	19.1	7.080	13	9	3	58.92	2.0458	11 54	18.2	10.446
14	7	21	15.10	2.3383	18 59	11.3	7.180	14	9	6	1.51	2.0407	11 43	50.2	10.488
15	7	23	35.20	2.3316	18 51	57.5	7.279	15	9	8	3.80	2.0357	11 33	19.6	10.529
16	7	25	54.89	2.3248	18 44	37.8	7.378	16	9	10	5.79	2.0306	11 22	46.7	10.568
17	7	28	14.18	2.3181	18 37	12.2	7.474	17	9	12	7.47	2.0255	11 12	11.4	10.608
18	7	30	33.06	2.3113	18 29	40.9	7.568	18	9	14	8.85	2.0206	11 1	33.8	10.646
19	7	32	51.54	2.3046	18 22	4.0	7.662	19	9	16	9.94	2.0158	10 50	54.0	10.683
20	7	35	9.61	2.2978	18 14	21.5	7.754	20	9	18	10.74	2.0110	10 40	12.0	10.718
21	7	37	27.28	2.2911	18 6	33.5	7.846	21	9	20	11.26	2.0063	10 29	27.9	10.753
22	7	39	44.54	2.2843	17 58	40.0	7.936	22	9	22	11.49	2.0015	10 18	41.8	10.786
23	7	42	1.39	2.2776	+17 50	41.2	-8.023	23	9	24	11.44	1.9969	+10 7	53.6	-10.819
NOVEMBER 22.							NOVEMBER 24.								
0	7	44	17.85	2.2709	+17 42	37.2	-8.110	0	9	26	11.12	1.9924	* 9 57	3.5	-10.851
1	7	46	33.90	2.2642	17 34	28.0	8.195	1	9	28	10.53	1.9879	9 46	11.5	10.883
2	7	48	49.55	2.2575	17 26	13.8	8.279	2	9	30	9.67	1.9834	9 35	17.6	10.913
3	7	51	4.80	2.2509	17 17	54.5	8.363	3	9	32	8.54	1.9791	9 24	22.0	10.942
4	7	53	19.66	2.2443	17 9	30.3	8.443	4	9	34	7.16	1.9748	9 13	24.6	10.970
5	7	55	34.11	2.2376	17 1	1.3	8.524	5	9	36	5.52	1.9705	9 2	25.6	10.998
6	7	57	48.17	2.2310	16 52	27.4	8.603	6	9	38	3.62	1.9663	8 51	24.9	11.025
7	8	0	1.83	2.2244	16 43	48.9	8.680	7	9	40	1.48	1.9623	8 40	22.6	11.051
8	8	2	15.10	2.2179	16 35	5.8	8.757	8	9	41	59.09	1.9583	8 29	18.8	11.076
9	8	4	27.98	2.2114	16 26	18.1	8.832	9	9	43	56.47	1.9543	8 18	13.5	11.100
10	8	6	40.47	2.2050	16 17	26.0	8.905	10	9	45	53.60	1.9503	8 7	6.8	11.123
11	8	8	52.58	2.1985	16 8	29.5	8.978	11	9	47	50.51	1.9465	7 55	58.7	11.146
12	8	11	4.29	2.1920	15 59	28.6	9.050	12	9	49	47.18	1.9427	7 44	49.3	11.168
13	8	13	15.62	2.1857	15 50	23.5	9.119	13	9	51	43.63	1.9390	7 33	38.6	11.188
14	8	15	26.57	2.1793	15 41	14.3	9.188	14	9	53	39.86	1.9353	7 22	26.7	11.208
15	8	17	37.14	2.1730	15 32	1.0	9.255	15	9	55	35.87	1.9318	7 11	13.6	11.228
16	8	19	47.33	2.1668	15 22	43.7	9.321	16	9	57	31.67	1.9283	6 59	59.3	11.247
17	8	21	57.15	2.1605	15 13	22.5	9.386	17	9	59	27.26	1.9248	6 48	43.9	11.264
18	8	24	6.59	2.1543	15 3	57.4	9.450	18	10	1	22.65	1.9215	6 37	27.6	11.281
19	8	26	15.66	2.1482	14 54	28.5	9.513	19	10	3	17.84	1.9181	6 26	10.2	11.298
20	8	28	24.37	2.1421	14 44	55.8	9.575	20	10	5	12.82	1.9148	6 14	51.8	11.313
21	8	30	32.71	2.1360	14 35	19.5	9.635	21	10	7	7.62	1.9118	6 3	32.6	11.328
22	8	32	40.69	2.1300	14 25	39.6	9.694	22	10	9	2.23	1.9086	5 52	12.5	11.342
23	8	34	48.31	2.1240	14 15	56.2	9.752	23	10	10	56.65	1.9055	5 40	51.8	11.355
24	8	36	55.57	2.1181	+14 6	9.4	-9.808	24	10	12	50.89	1.9025	+ 5 29	29.9	-11.368

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.
NOVEMBER 25.					NOVEMBER 27.			
	h m s	s	° ' "	"		h m s	s	° ' "
0	10 12 50.89	1.9025	+5 29 29.9	-11.368	0	11 41 58.77	1.8358	- 3 37 54.5
1	10 14 44.95	1.8996	5 18 7.5	11.379	1	11 43 48.92	1.8360	3 49 6.1
2	10 16 38.84	1.8968	5 6 44.4	11.391	2	11 45 39.09	1.8362	4 0 16.5
3	10 18 32.57	1.8940	4 55 20.6	11.401	3	11 47 29.26	1.8363	4 11 25.9
4	10 20 26.12	1.8913	4 43 56.3	11.411	4	11 49 19.45	1.8368	4 22 34.0
5	10 22 19.52	1.8887	4 32 31.3	11.420	5	11 51 9.67	1.8372	4 33 40.9
6	10 24 12.76	1.8860	4 21 5.9	11.428	6	11 52 59.91	1.8375	4 44 46.6
7	10 26 5.84	1.8835	4 9 40.0	11.435	7	11 54 50.17	1.8380	4 55 51.0
8	10 27 58.78	1.8811	3 58 13.7	11.443	8	11 56 40.47	1.8386	5 6 54.0
9	10 29 51.57	1.8787	3 46 46.9	11.449	9	11 58 30.80	1.8392	5 17 55.7
10	10 31 44.22	1.8763	3 35 19.8	11.453	10	12 0 21.17	1.8398	5 28 56.0
11	10 33 36.73	1.8741	3 23 52.5	11.458	11	12 2 11.57	1.8405	5 39 54.9
12	10 35 29.11	1.8719	3 12 24.8	11.463	12	12 4 2.03	1.8413	5 50 52.3
13	10 37 21.36	1.8698	3 0 56.9	11.467	13	12 5 52.53	1.8422	6 1 48.2
14	10 39 13.48	1.8678	2 49 28.8	11.470	14	12 7 43.09	1.8430	6 12 42.6
15	10 41 5.49	1.8658	2 38 0.5	11.472	15	12 9 33.69	1.8439	6 23 35.5
16	10 42 57.37	1.8638	2 26 32.2	11.473	16	12 11 24.36	1.8450	6 34 26.7
17	10 44 49.14	1.8620	2 15 3.7	11.475	17	12 13 15.09	1.8460	6 45 16.3
18	10 46 40.81	1.8602	2 3 35.2	11.475	18	12 15 5.88	1.8471	6 56 4.2
19	10 48 32.36	1.8584	1 52 6.7	11.475	19	12 16 56.74	1.8482	7 6 50.4
20	10 50 23.82	1.8568	1 40 38.2	11.474	20	12 18 47.66	1.8494	7 17 34.8
21	10 52 15.18	1.8552	1 29 9.8	11.472	21	12 20 38.67	1.8508	7 28 17.5
22	10 54 6.44	1.8536	1 17 41.6	11.470	22	12 22 29.75	1.8520	7 38 58.4
23	10 55 57.61	1.8522	+1 6 13.4	-11.468	23	12 24 20.91	1.8533	- 7 49 37.4
NOVEMBER 26.					NOVEMBER 28.			
	h m s	s	° ' "	"		h m s	s	° ' "
0	10 57 48.70	1.8508	+0 54 45.5	-11.463	0	12 26 12.15	1.8548	- 8 0 14.5
1	10 59 39.71	1.8494	0 43 17.8	11.459	1	12 28 3.48	1.8563	8 10 49.7
2	11 1 30.63	1.8481	0 31 50.4	11.455	2	12 29 54.90	1.8578	8 21 22.9
3	11 3 21.48	1.8469	0 20 23.2	11.450	3	12 31 46.41	1.8593	8 31 54.2
4	11 5 12.26	1.8458	+0 8 56.4	11.443	4	12 33 38.02	1.8609	8 42 23.4
5	11 7 2.98	1.8448	-0 2 30.0	11.438	5	12 35 29.72	1.8626	8 52 50.5
6	11 8 53.63	1.8437	0 13 56.1	11.431	6	12 37 21.53	1.8643	9 3 15.6
7	11 10 44.22	1.8427	0 25 21.7	11.423	7	12 39 13.44	1.8661	9 13 38.5
8	11 12 34.75	1.8418	0 36 46.8	11.414	8	12 41 5.46	1.8679	9 23 59.2
9	11 14 25.24	1.8410	0 48 11.4	11.405	9	12 42 57.59	1.8698	9 34 17.7
10	11 16 15.67	1.8402	0 59 35.4	11.396	10	12 44 49.83	1.8717	9 44 34.0
11	11 18 6.06	1.8395	1 10 58.9	11.386	11	12 46 42.19	1.8737	9 54 48.0
12	11 19 56.41	1.8388	1 22 21.7	11.375	12	12 48 34.67	1.8757	10 4 59.6
13	11 21 46.72	1.8383	1 33 43.9	11.364	13	12 50 27.27	1.8777	10 15 8.9
14	11 23 37.00	1.8378	1 45 5.4	11.353	14	12 52 19.99	1.8798	10 25 15.7
15	11 25 27.25	1.8373	1 56 26.2	11.340	15	12 54 12.84	1.8819	10 35 20.1
16	11 27 17.47	1.8369	2 7 46.2	11.327	16	12 56 5.82	1.8841	10 45 22.1
17	11 29 7.68	1.8366	2 19 5.4	11.313	17	12 57 58.93	1.8863	10 55 21.5
18	11 30 57.86	1.8363	2 30 23.7	11.299	18	12 59 52.18	1.8887	11 5 18.3
19	11 32 48.03	1.8361	2 41 41.3	11.285	19	13 1 45.57	1.8909	11 15 12.6
20	11 34 38.19	1.8358	2 52 57.9	11.268	20	13 3 39.09	1.8933	11 25 4.2
21	11 36 28.33	1.8358	3 4 13.5	11.253	21	13 5 32.76	1.8957	11 34 53.2
22	11 38 18.48	1.8358	3 15 28.2	11.237	22	13 7 26.57	1.8981	11 44 39.4
23	11 40 8.62	1.8358	3 26 41.9	11.219	23	13 9 20.53	1.9006	11 54 22.9
24	11 41 58.77	1.8358	-3 37 54.5	-11.202	24	13 11 14.64	1.9031	-12 4 3.6

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
NOVEMBER 29.									DECEMBER 1.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	13	11	14.64	1.9031	-12	4	3.6	-9.655	0	14	46	6.57	2.0582	-18	40	25.2	-6.587
1	13	13	8.90	1.9057	12	13	41.5	9.607	1	14	48	10.17	2.0618	18	46	58.0	6.506
2	13	15	3.32	1.9083	12	23	16.4	9.558	2	14	50	13.98	2.0653	18	53	25.9	6.423
3	13	16	57.90	1.9110	12	32	48.5	9.510	3	14	52	18.01	2.0690	18	59	48.8	6.340
4	13	18	52.64	1.9136	12	42	17.6	9.461	4	14	54	22.26	2.0726	19	6	6.7	6.257
5	13	20	47.53	1.9163	12	51	43.8	9.411	5	14	56	26.72	2.0761	19	12	19.6	6.173
6	13	22	42.59	1.9191	13	1	6.9	9.359	6	14	58	31.39	2.0797	19	18	27.4	6.088
7	13	24	37.82	1.9219	13	10	26.9	9.308	7	15	0	36.28	2.0833	19	24	30.1	6.002
8	13	26	33.22	1.9248	13	19	43.9	9.256	8	15	2	41.39	2.0868	19	30	27.6	5.915
9	13	28	28.79	1.9276	13	28	57.6	9.203	9	15	4	46.70	2.0903	19	36	19.9	5.828
10	13	30	24.53	1.9304	13	38	8.2	9.150	10	15	6	52.23	2.0940	19	42	6.9	5.740
11	13	32	20.44	1.9333	13	47	15.6	9.095	11	15	8	57.98	2.0975	19	47	48.7	5.652
12	13	34	16.53	1.9363	13	56	19.6	9.039	12	15	11	3.93	2.1009	19	53	25.1	5.562
13	13	36	12.80	1.9393	14	5	20.3	8.984	13	15	13	10.09	2.1045	19	58	56.1	5.472
14	13	38	9.25	1.9423	14	14	17.7	8.928	14	15	15	16.47	2.1080	20	4	21.7	5.381
15	13	40	5.88	1.9454	14	23	11.7	8.871	15	15	17	23.05	2.1114	20	9	41.8	5.290
16	13	42	2.70	1.9485	14	32	2.2	8.813	16	15	19	29.84	2.1149	20	14	56.5	5.198
17	13	43	59.70	1.9516	14	40	49.3	8.755	17	15	21	36.84	2.1183	20	20	5.6	5.104
18	13	45	56.89	1.9548	14	49	32.8	8.695	18	15	23	44.04	2.1218	20	25	9.0	5.011
19	13	47	54.27	1.9579	14	58	12.7	8.636	19	15	25	51.45	2.1252	20	30	6.9	4.918
20	13	49	51.84	1.9612	15	6	49.1	8.576	20	15	27	59.06	2.1285	20	34	59.1	4.823
21	13	51	49.61	1.9643	15	15	21.8	8.514	21	15	30	6.87	2.1319	20	39	45.6	4.728
22	13	53	47.56	1.9676	15	23	50.8	8.452	22	15	32	14.89	2.1353	20	44	26.4	4.632
23	13	55	45.72	1.9709	-15	32	16.0	-8.389	23	15	34	23.10	2.1385	-20	49	1.4	-4.534
NOVEMBER 30.									DECEMBER 2.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	13	57	44.07	1.9742	-15	40	37.5	-8.326	0	15	36	31.51	2.1418	-20	53	30.5	-4.437
1	13	59	42.62	1.9775	15	48	55.1	8.262	1	15	38	40.12	2.1451	20	57	53.8	4.339
2	14	1	41.37	1.9808	15	57	8.9	8.198	2	15	40	48.92	2.1483	21	2	11.2	4.240
3	14	3	40.32	1.9843	16	5	18.8	8.132	3	15	42	57.91	2.1514	21	6	22.6	4.141
4	14	5	39.48	1.9877	16	13	24.7	8.065	4	15	45	7.09	2.1547	21	10	28.1	4.042
5	14	7	38.84	1.9910	16	21	26.6	7.998	5	15	47	16.47	2.1578	21	14	27.6	3.941
6	14	9	38.40	1.9944	16	29	24.5	7.931	6	15	49	26.03	2.1608	21	18	21.0	3.840
7	14	11	38.17	1.9979	16	37	18.3	7.862	7	15	51	35.77	2.1639	21	22	8.4	3.738
8	14	13	38.15	2.0014	16	45	7.9	7.793	8	15	53	45.70	2.1670	21	25	49.6	3.636
9	14	15	38.34	2.0048	16	52	53.4	7.723	9	15	55	55.81	2.1700	21	29	24.7	3.533
10	14	17	38.73	2.0083	17	0	34.7	7.653	10	15	58	6.10	2.1729	21	32	53.6	3.430
11	14	19	39.34	2.0118	17	8	11.7	7.581	11	16	0	16.56	2.1758	21	36	16.3	3.326
12	14	21	40.15	2.0153	17	15	44.4	7.509	12	16	2	27.20	2.1788	21	39	32.7	3.221
13	14	23	41.18	2.0189	17	23	12.8	7.436	13	16	4	38.01	2.1816	21	42	42.8	3.117
14	14	25	42.42	2.0224	17	30	36.7	7.363	14	16	6	48.99	2.1843	21	45	46.7	3.011
15	14	27	43.87	2.0260	17	37	56.3	7.288	15	16	9	0.13	2.1871	21	48	44.1	2.904
16	14	29	45.54	2.0296	17	45	11.3	7.213	16	16	11	11.44	2.1898	21	51	35.2	2.798
17	14	31	47.42	2.0331	17	52	21.8	7.138	17	16	13	22.91	2.1925	21	54	19.9	2.691
18	14	33	49.51	2.0367	17	59	27.8	7.061	18	16	15	34.54	2.1951	21	56	58.1	2.583
19	14	35	51.82	2.0403	18	6	29.1	6.983	19	16	17	46.32	2.1977	21	59	29.9	2.475
20	14	37	54.34	2.0438	18	13	25.8	6.906	20	16	19	58.26	2.2003	22	1	55.1	2.367
21	14	39	57.07	2.0473	18	20	17.8	6.828	21	16	22	10.35	2.2028	22	4	13.9	2.258
22	14	42	0.02	2.0510	18	27	5.1	6.748	22	16	24	22.59	2.2052	22	6	26.0	2.148
23	14	44	3.19	2.0546	18	33	47.6	6.668	23	16	26	34.97	2.2075	22	8	31.6	2.038
24	14	46	6.57	2.0582	-18	40	25.2	-6.587	24	16	28	47.49	2.2098	-22	10	30.6	-1.928

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	
DECEMBER 3.							DECEMBER 5.						
	h	m	s	s	° ' "	"		h	m	s	s	° ' "	
0	16	28	47.49	2.2098	-22 10 30.6	-1.928	0	18	16	29.16	2.2547	-21 30 35.9	
1	16	31	0.15	2.2122	22 12 23.0	1.817	1	18	18	44.43	2.2543	21 26 54.5	
2	16	33	12.95	2.2144	22 14 8.6	1.705	2	18	20	59.67	2.2537	21 23 6.1	
3	16	35	25.88	2.2166	22 15 47.6	1.594	3	18	23	14.87	2.2531	21 19 10.8	
4	16	37	38.94	2.2187	22 17 19.9	1.483	4	18	25	30.04	2.2524	21 15 8.6	
5	16	39	52.12	2.2208	22 18 45.5	1.370	5	18	27	45.16	2.2518	21 10 59.5	
6	16	42	5.43	2.2228	22 20 4.3	1.257	6	18	30	0.25	2.2511	21 6 43.5	
7	16	44	18.86	2.2248	22 21 16.3	1.143	7	18	32	15.29	2.2502	21 2 20.7	
8	16	46	32.40	2.2266	22 22 21.5	1.030	8	18	34	30.27	2.2493	20 57 51.1	
9	16	48	46.05	2.2285	22 23 19.9	0.917	9	18	36	45.21	2.2485	20 53 14.6	
10	16	50	59.82	2.2303	22 24 11.5	0.803	10	18	39	0.09	2.2476	20 48 31.4	
11	16	53	13.69	2.2321	22 24 56.3	0.688	11	18	41	14.92	2.2466	20 43 41.4	
12	16	55	27.67	2.2338	22 25 34.1	0.573	12	18	43	29.68	2.2456	20 38 44.6	
13	16	57	41.75	2.2354	22 26 5.1	0.458	13	18	45	44.38	2.2445	20 33 41.1	
14	16	59	55.92	2.2370	22 26 29.1	0.343	14	18	47	59.02	2.2434	20 28 30.9	
15	17	2	10.19	2.2385	22 26 46.2	0.228	15	18	50	13.59	2.2423	20 23 14.0	
16	17	4	24.54	2.2399	22 26 56.5	-0.113	16	18	52	28.09	2.2411	20 17 50.5	
17	17	6	38.98	2.2413	22 26 59.7	+0.004	17	18	54	42.52	2.2398	20 12 20.4	
18	17	8	53.50	2.2427	22 26 56.0	0.120	18	18	56	56.87	2.2386	20 6 43.7	
19	17	11	8.10	2.2439	22 26 45.3	0.237	19	18	59	11.15	2.2373	20 1 0.3	
20	17	13	22.77	2.2452	22 26 27.6	0.353	20	19	1	25.34	2.2359	19 55 10.5	
21	17	15	37.52	2.2463	22 26 2.9	0.470	21	19	3	39.46	2.2347	19 49 14.1	
22	17	17	52.33	2.2473	22 25 31.2	0.587	22	19	5	53.50	2.2333	19 43 11.3	
23	17	20	7.20	2.2484	-22 24 52.5	+0.703	23	19	8	7.45	2.2318	-19 37 2.0	
DECEMBER 4.							DECEMBER 6.						
0	17	22	22.14	2.2494	-22 24 6.8	+0.821	0	19	10	21.31	2.2303	-19 30 46.3	
1	17	24	37.13	2.2503	22 23 14.0	0.938	1	19	12	35.09	2.2288	19 24 24.2	
2	17	26	52.17	2.2512	22 22 14.2	1.055	2	19	14	48.77	2.2273	19 17 55.7	
3	17	29	7.27	2.2520	22 21 7.4	1.173	3	19	17	2.37	2.2258	19 11 21.0	
4	17	31	22.41	2.2527	22 19 53.5	1.290	4	19	19	15.87	2.2242	19 4 39.9	
5	17	33	37.59	2.2533	22 18 32.6	1.408	5	19	21	29.27	2.2226	18 57 52.5	
6	17	35	52.80	2.2539	22 17 4.5	1.526	6	19	23	42.58	2.2211	18 50 59.0	
7	17	38	8.06	2.2545	22 15 29.5	1.643	7	19	25	55.80	2.2194	18 43 59.2	
8	17	40	23.34	2.2550	22 13 47.4	1.761	8	19	28	8.91	2.2177	18 36 53.3	
9	17	42	38.66	2.2554	22 11 58.2	1.878	9	19	30	21.92	2.2161	18 29 41.2	
10	17	44	53.99	2.2558	22 10 2.0	1.996	10	19	32	34.84	2.2143	18 22 23.1	
11	17	47	9.35	2.2561	22 7 58.7	2.114	11	19	34	47.64	2.2126	18 14 58.9	
12	17	49	24.72	2.2563	22 5 48.3	2.232	12	19	37	0.35	2.2109	18 7 28.7	
13	17	51	40.10	2.2565	22 3 30.9	2.349	13	19	39	12.95	2.2092	17 59 52.5	
14	17	53	55.50	2.2566	22 1 6.4	2.466	14	19	41	25.45	2.2074	17 52 10.5	
15	17	56	10.89	2.2566	21 58 35.0	2.583	15	19	43	37.84	2.2056	17 44 22.5	
16	17	58	26.29	2.2567	21 55 56.4	2.701	16	19	45	50.12	2.2038	17 36 28.6	
17	18	0	41.69	2.2567	21 53 10.9	2.818	17	19	48	2.29	2.2020	17 28 28.9	
18	18	2	57.09	2.2565	21 50 18.3	2.935	18	19	50	14.36	2.2003	17 20 23.5	
19	18	5	12.47	2.2563	21 47 18.7	3.052	19	19	52	26.32	2.1984	17 12 12.3	
20	18	7	27.85	2.2561	21 44 12.1	3.168	20	19	54	38.17	2.1967	17 3 55.5	
21	18	9	43.20	2.2558	21 40 58.5	3.284	21	19	56	49.92	2.1948	16 55 33.0	
22	18	11	58.55	2.2556	21 37 38.0	3.401	22	19	59	1.55	2.1930	16 47 4.9	
23	18	14	13.87	2.2551	21 34 10.4	3.518	23	20	1	13.08	2.1912	16 38 31.3	
24	18	16	29.16	2.2547	-21 30 35.9	+3.633	24	20	3	24.49	2.1893	-16 29 52.1	

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
DECEMBER 7.									DECEMBER 9.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	20	3	24.49	2.1893	-16	29	52.1	+ 8.698	0	21	46	39.42	2.1231	-8	2	9.2	+12.124
1	20	5	35.80	2.1875	16	21	7.5	8.789	1	21	48	46.79	2.1226	7	50	0.2	12.173
2	20	7	46.99	2.1857	16	12	17.4	8.879	2	21	50	54.13	2.1222	7	37	48.4	12.222
3	20	9	58.08	2.1838	16	3	22.0	8.968	3	21	53	1.45	2.1218	7	25	33.6	12.269
4	20	12	9.05	2.1820	15	54	21.3	9.057	4	21	55	8.74	2.1213	7	13	16.1	12.316
5	20	14	19.92	2.1803	15	45	15.2	9.145	5	21	57	16.01	2.1210	7	0	55.7	12.362
6	20	16	30.68	2.1784	15	36	3.9	9.232	6	21	59	23.26	2.1208	6	48	32.7	12.405
7	20	18	41.33	2.1767	15	26	47.4	9.318	7	22	1	30.50	2.1206	6	36	7.1	12.448
8	20	20	51.88	2.1748	15	17	25.7	9.403	8	22	3	37.73	2.1203	6	23	38.9	12.491
9	20	23	2.31	2.1731	15	7	59.0	9.488	9	22	5	44.94	2.1203	6	11	8.2	12.533
10	20	25	12.65	2.1713	14	58	27.1	9.573	10	22	7	52.16	2.1203	5	58	35.0	12.573
11	20	27	22.87	2.1695	14	48	50.3	9.655	11	22	9	59.37	2.1202	5	45	59.4	12.613
12	20	29	32.99	2.1678	14	39	8.5	9.738	12	22	12	6.58	2.1203	5	33	21.5	12.651
13	20	31	43.01	2.1661	14	29	21.8	9.819	13	22	14	13.80	2.1204	5	20	41.3	12.688
14	20	33	52.92	2.1643	14	19	30.2	9.900	14	22	16	21.03	2.1206	5	7	58.9	12.724
15	20	36	2.73	2.1627	14	9	33.8	9.979	15	22	18	28.27	2.1208	4	55	14.4	12.759
16	20	38	12.44	2.1610	13	59	32.7	10.058	16	22	20	35.52	2.1210	4	42	27.8	12.794
17	20	40	22.05	2.1593	13	49	26.8	10.138	17	22	22	42.79	2.1213	4	29	39.1	12.828
18	20	42	31.56	2.1578	13	39	16.2	10.214	18	22	24	50.08	2.1218	4	16	48.5	12.859
19	20	44	40.98	2.1561	13	29	1.1	10.291	19	22	26	57.40	2.1223	4	3	56.0	12.891
20	20	46	50.29	2.1545	13	18	41.3	10.367	20	22	29	4.75	2.1228	3	51	1.6	12.922
21	20	48	59.52	2.1530	13	8	17.1	10.441	21	22	31	12.13	2.1233	3	38	5.4	12.950
22	20	51	8.65	2.1513	12	57	48.4	10.515	22	22	33	19.55	2.1239	3	25	7.6	12.978
23	20	53	17.68	2.1498	-12	47	15.3	+10.588	23	22	35	27.00	2.1246	-3	12	8.1	+13.005
DECEMBER 8.									DECEMBER 10.								
0	20	55	26.63	2.1484	-12	36	37.8	+10.661	0	22	37	34.50	2.1254	-2	59	7.0	+13.031
1	20	57	35.49	2.1469	12	25	56.0	10.732	1	22	39	42.05	2.1262	2	46	4.4	13.056
2	20	59	44.26	2.1455	12	15	10.0	10.803	2	22	41	49.64	2.1270	2	33	0.3	13.079
3	21	1	52.95	2.1441	12	4	19.7	10.873	3	22	43	57.29	2.1280	2	19	54.9	13.103
4	21	4	1.55	2.1427	11	53	25.3	10.941	4	22	46	5.00	2.1291	2	6	48.1	13.123
5	21	6	10.07	2.1414	11	42	26.8	11.008	5	22	48	12.78	2.1301	1	53	40.1	13.143
6	21	8	18.52	2.1401	11	31	24.3	11.075	6	22	50	20.61	2.1312	1	40	30.9	13.163
7	21	10	26.88	2.1388	11	20	17.8	11.142	7	22	52	28.52	2.1324	1	27	20.5	13.183
8	21	12	35.17	2.1376	11	9	7.3	11.208	8	22	54	36.50	2.1336	1	14	9.1	13.198
9	21	14	43.39	2.1363	10	57	52.9	11.271	9	22	56	44.55	2.1349	1	0	56.7	13.214
10	21	16	51.53	2.1352	10	46	34.8	11.334	10	22	58	52.69	2.1363	0	47	43.4	13.229
11	21	18	59.61	2.1341	10	35	12.8	11.397	11	23	1	0.91	2.1378	0	34	29.2	13.243
12	21	21	7.62	2.1330	10	23	47.2	11.458	12	23	3	9.22	2.1393	0	21	14.2	13.256
13	21	23	15.57	2.1319	10	12	17.9	11.519	13	23	5	17.62	2.1408	-0	7	58.5	13.267
14	21	25	23.45	2.1308	10	0	44.9	11.579	14	23	7	26.12	2.1425	+0	5	17.8	13.277
15	21	27	31.27	2.1298	9	49	8.4	11.638	15	23	9	34.72	2.1442	0	18	34.7	13.287
16	21	29	39.03	2.1290	9	37	28.4	11.696	16	23	11	43.42	2.1459	0	31	52.2	13.294
17	21	31	46.75	2.1281	9	25	44.9	11.753	17	23	13	52.23	2.1478	0	45	10.0	13.301
18	21	33	54.40	2.1272	9	13	58.1	11.808	18	23	16	1.15	2.1496	0	58	28.3	13.307
19	21	36	2.01	2.1265	9	2	7.9	11.863	19	23	18	10.18	2.1516	1	11	46.8	13.311
20	21	38	9.58	2.1258	8	50	14.5	11.917	20	23	20	19.34	2.1537	1	25	5.6	13.314
21	21	40	17.10	2.1250	8	38	17.9	11.971	21	23	22	28.62	2.1557	1	38	24.5	13.317
22	21	42	24.58	2.1243	8	26	18.0	12.023	22	23	24	38.02	2.1578	1	51	43.6	13.318
23	21	44	32.02	2.1237	8	14	15.1	12.073	23	23	26	47.56	2.1601	2	5	2.8	13.327
24	21	46	39.42	2.1231	-8	2	9.2	+12.124	24	23	28	57.23	2.1623	+2	18	21.6	+13.335

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	V P M
DECEMBER 11.					DECEMBER 13.				
0	h m s	s	" "	" "	0	h m s	s	" "	" "
0	23 28 57.23	2.1623	+ 2 18 21.6	+13.315	0	1 16 31.06	2.3399	+12 30 40.0	+11
1	23 31 7.04	2.1647	2 31 40.4	13.313	1	1 18 51.60	2.3448	12 42 17.5	11
2	23 33 16.99	2.1671	2 44 59.1	13.308	2	1 21 12.43	2.3495	12 53 50.7	11
3	23 35 27.09	2.1696	2 58 17.4	13.303	3	1 23 33.54	2.3543	13 5 19.5	11
4	23 37 37.34	2.1721	3 11 35.4	13.297	4	1 25 54.95	2.3593	13 16 43.9	11
5	23 39 47.74	2.1748	3 24 53.0	13.288	5	1 28 16.66	2.3643	13 28 3.8	11
6	23 41 58.31	2.1774	3 38 10.0	13.279	6	1 30 38.66	2.3692	13 39 19.1	11
7	23 44 9.03	2.1800	3 51 26.5	13.269	7	1 33 0.96	2.3741	13 50 29.6	11
8	23 46 19.91	2.1828	4 4 42.3	13.258	8	1 35 23.55	2.3790	14 1 35.3	11
9	23 48 30.97	2.1858	4 17 57.4	13.244	9	1 37 46.44	2.3840	14 12 36.1	10
10	23 50 42.20	2.1887	4 31 11.6	13.230	10	1 40 9.63	2.3890	14 23 31.9	10
11	23 52 53.61	2.1916	4 44 25.0	13.215	11	1 42 33.12	2.3940	14 34 22.7	10
12	23 55 5.19	2.1946	4 57 37.4	13.198	12	1 44 56.91	2.3990	14 45 8.2	10
13	23 57 16.96	2.1978	5 10 48.7	13.179	13	1 47 21.00	2.4039	14 55 48.5	10
14	23 59 28.92	2.2009	5 23 58.9	13.160	14	1 49 45.38	2.4089	15 6 23.3	10
15	0 1 41.07	2.2041	5 37 7.9	13.140	15	1 52 10.07	2.4140	15 16 52.7	10
16	0 3 53.41	2.2074	5 50 15.7	13.118	16	1 54 35.06	2.4190	15 27 16.6	10
17	0 6 5.96	2.2108	6 3 22.0	13.093	17	1 57 0.35	2.4239	15 37 34.8	10
18	0 8 18.70	2.2141	6 16 26.9	13.069	18	1 59 25.93	2.4289	15 47 47.2	10
19	0 10 31.65	2.2176	6 29 30.3	13.043	19	2 1 51.82	2.4340	15 57 53.8	10
20	0 12 44.81	2.2211	6 42 32.0	13.014	20	2 4 18.01	2.4389	16 7 54.6	9
21	0 14 58.18	2.2247	6 55 32.0	12.986	21	2 6 44.49	2.4439	16 17 49.3	9
22	0 17 11.77	2.2283	7 8 30.3	12.956	22	2 9 11.28	2.4489	16 27 37.9	9
23	0 19 25.58	2.2320	+ 7 21 26.7	+12.924	23	2 11 38.36	2.4538	+16 37 20.3	+ 9
DECEMBER 12.					DECEMBER 14.				
0	0 21 39.61	2.2358	+ 7 34 21.2	+12.891	0	2 14 5.73	2.4587	+16 46 56.5	+ 9
1	0 23 53.87	2.2395	7 47 13.6	12.857	1	2 16 33.40	2.4637	16 56 26.3	9
2	0 26 8.35	2.2433	8 0 4.0	12.821	2	2 19 1.37	2.4685	17 5 49.5	9
3	0 28 23.07	2.2473	8 12 52.1	12.783	3	2 21 29.62	2.4733	17 15 6.3	9
4	0 30 38.03	2.2513	8 25 38.0	12.744	4	2 23 58.17	2.4782	17 24 16.4	9
5	0 32 53.22	2.2553	8 38 21.4	12.703	5	2 26 27.00	2.4829	17 33 19.7	8
6	0 35 8.66	2.2593	8 51 2.4	12.663	6	2 28 56.12	2.4877	17 42 16.2	8
7	0 37 24.34	2.2634	9 3 40.9	12.620	7	2 31 25.52	2.4923	17 51 5.9	8
8	0 39 40.27	2.2676	9 16 16.8	12.575	8	2 33 55.20	2.4971	17 59 48.5	8
9	0 41 56.45	2.2718	9 28 49.9	12.528	9	2 36 25.17	2.5017	18 8 24.1	8
10	0 44 12.88	2.2760	9 41 20.2	12.482	10	2 38 55.40	2.5063	18 16 52.5	8
11	0 46 29.57	2.2803	9 53 47.7	12.433	11	2 41 25.92	2.5108	18 25 13.6	8
12	0 48 46.52	2.2847	10 6 12.1	12.382	12	2 43 56.70	2.5153	18 33 27.5	8
13	0 51 3.73	2.2891	10 18 33.5	12.330	13	2 46 27.75	2.5198	18 41 33.9	8
14	0 53 21.21	2.2936	10 30 51.7	12.276	14	2 48 59.07	2.5241	18 49 32.9	7
15	0 55 38.96	2.2980	10 43 6.6	12.221	15	2 51 30.64	2.5283	18 57 34.3	7
16	0 57 56.97	2.3025	10 55 18.2	12.165	16	2 54 2.47	2.5327	19 5 8.0	7
17	1 0 15.26	2.3071	11 7 26.4	12.108	17	2 56 34.56	2.5369	19 12 44.1	7
18	1 2 33.82	2.3116	11 19 31.1	12.048	18	2 59 6.90	2.5410	19 20 12.3	7
19	1 4 52.65	2.3163	11 31 32.1	11.987	19	3 1 39.48	2.5450	19 27 32.6	7
20	1 7 11.77	2.3210	11 43 29.5	11.924	20	3 4 12.30	2.5490	19 34 45.0	7
21	1 9 31.17	2.3257	11 55 23.0	11.860	21	3 6 45.36	2.5529	19 41 49.4	7
22	1 11 50.85	2.3303	12 7 12.7	11.795	22	3 9 18.65	2.5568	19 48 45.7	6
23	1 14 10.81	2.3351	12 18 58.4	11.728	23	3 11 52.17	2.5605	19 55 33.9	6
24	1 16 31.06	2.3399	+12 30 40.0	+11.659	24	3 14 25.91	2.5642	+20 2 13.8	+ 6

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 15.					DECEMBER 17.				
0	h m s	s	" ' "	"	0	h m s	s	" ' "	"
0	3 14 25.91	2.5642	+20 2 13.8	+6.596	0	5 19 42.77	2.6077	+22 25 14.1	-0.785
1	3 16 59.87	2.5678	20 8 45.4	6.458	1	5 22 19.16	2.6083	22 24 22.3	0.941
2	3 19 34.05	2.5713	20 15 8.7	6.318	2	5 24 55.41	2.6080	22 23 21.2	1.097
3	3 22 8.43	2.5748	20 21 23.5	6.176	3	5 27 31.52	2.6004	22 22 10.7	1.262
4	3 24 43.02	2.5782	20 27 29.8	6.033	4	5 30 7.46	2.5977	22 20 51.0	1.406
5	3 27 17.81	2.5813	20 33 27.5	5.891	5	5 32 43.24	2.5949	22 19 22.0	1.560
6	3 29 52.78	2.5844	20 39 16.7	5.747	6	5 35 18.85	2.5920	22 17 43.8	1.713
7	3 32 27.94	2.5875	20 44 57.1	5.602	7	5 37 54.28	2.5889	22 15 56.5	1.865
8	3 35 3.28	2.5904	20 50 28.9	5.456	8	5 40 29.52	2.5858	22 14 0.0	2.018
9	3 37 38.79	2.5933	20 55 51.8	5.308	9	5 43 4.57	2.5825	22 11 54.4	2.169
10	3 40 14.47	2.5961	21 1 5.9	5.161	10	5 45 39.42	2.5791	22 9 39.7	2.319
11	3 42 50.32	2.5987	21 6 11.1	5.013	11	5 48 14.06	2.5755	22 7 16.1	2.468
12	3 45 26.31	2.6012	21 11 7.4	4.863	12	5 50 48.48	2.5718	22 4 43.5	2.618
13	3 48 2.46	2.6036	21 15 54.7	4.713	13	5 53 22.68	2.5681	22 2 2.0	2.766
14	3 50 38.74	2.6058	21 20 32.9	4.562	14	5 55 56.65	2.5642	21 59 11.6	2.914
15	3 53 15.16	2.6081	21 25 2.1	4.410	15	5 58 30.38	2.5602	21 56 12.3	3.060
16	3 55 51.71	2.6102	21 29 22.1	4.258	16	6 1 3.87	2.5561	21 53 4.4	3.205
17	3 58 28.38	2.6121	21 33 33.0	4.105	17	6 3 37.11	2.5519	21 49 47.7	3.350
18	4 1 5.16	2.6138	21 37 34.7	3.951	18	6 6 10.10	2.5476	21 46 22.4	3.493
19	4 3 42.04	2.6156	21 41 27.1	3.796	19	6 8 42.82	2.5432	21 42 48.5	3.636
20	4 6 19.03	2.6173	21 45 10.2	3.642	20	6 11 15.28	2.5388	21 39 6.1	3.778
21	4 8 56.11	2.6187	21 48 44.1	3.486	21	6 13 47.47	2.5341	21 35 15.2	3.918
22	4 11 33.27	2.6200	21 52 8.5	3.330	22	6 16 19.37	2.5294	21 31 15.9	4.058
23	4 14 10.51	2.6212	+21 55 23.7	+3.174	23	6 18 51.00	2.5247	+21 27 8.3	-4.196
DECEMBER 16.					DECEMBER 18.				
0	4 16 47.81	2.6223	+21 58 29.4	+3.017	0	6 21 22.33	2.5198	+21 22 52.4	-4.333
1	4 19 25.18	2.6232	22 1 25.7	2.859	1	6 23 53.37	2.5148	21 18 28.3	4.469
2	4 22 2.59	2.6240	22 4 12.5	2.702	2	6 26 24.10	2.5098	21 13 56.1	4.604
3	4 24 40.06	2.6247	22 6 49.9	2.544	3	6 28 54.54	2.5047	21 9 15.8	4.738
4	4 27 17.55	2.6252	22 9 17.8	2.385	4	6 31 24.66	2.4994	21 4 27.5	4.871
5	4 29 55.08	2.6257	22 11 36.1	2.227	5	6 33 54.47	2.4941	20 59 31.3	5.003
6	4 32 32.63	2.6259	22 13 45.0	2.068	6	6 36 23.95	2.4888	20 54 27.2	5.133
7	4 35 10.19	2.6261	22 15 44.3	1.909	7	6 38 53.12	2.4833	20 49 15.3	5.263
8	4 37 47.76	2.6261	22 17 34.1	1.751	8	6 41 21.95	2.4778	20 43 55.7	5.390
9	4 40 25.32	2.6259	22 19 14.4	1.592	9	6 43 50.46	2.4723	20 38 28.5	5.517
10	4 43 2.87	2.6257	22 20 45.1	1.432	10	6 46 18.63	2.4667	20 32 53.7	5.643
11	4 45 40.40	2.6253	22 22 6.2	1.273	11	6 48 46.46	2.4609	20 27 11.4	5.767
12	4 48 17.91	2.6248	22 23 17.8	1.113	12	6 51 13.94	2.4552	20 21 21.7	5.889
13	4 50 55.38	2.6241	22 24 19.8	0.954	13	6 53 41.08	2.4494	20 15 24.7	6.011
14	4 53 32.80	2.6233	22 25 12.3	0.796	14	6 56 7.87	2.4435	20 9 20.4	6.131
15	4 56 10.17	2.6223	22 25 55.3	0.637	15	6 58 34.30	2.4376	20 3 9.0	6.249
16	4 58 47.48	2.6212	22 26 28.7	0.477	16	7 1 0.38	2.4316	19 56 50.5	6.368
17	5 1 24.71	2.6200	22 26 52.5	0.318	17	7 3 26.09	2.4256	19 50 24.9	6.483
18	5 4 1.88	2.6187	22 27 6.9	0.160	18	7 5 51.45	2.4196	19 43 52.5	6.598
19	5 6 38.95	2.6172	22 27 11.7	+0.002	19	7 8 16.44	2.4134	19 37 13.1	6.712
20	5 9 15.94	2.6156	22 27 7.1	-0.156	20	7 10 41.06	2.4073	19 30 27.0	6.823
21	5 11 52.82	2.6138	22 26 53.0	0.313	21	7 13 5.32	2.4012	19 23 34.3	6.934
22	5 14 29.59	2.6118	22 26 29.5	0.471	22	7 15 29.20	2.3949	19 16 34.9	7.044
23	5 17 6.24	2.6098	22 25 56.5	0.628	23	7 17 52.71	2.3887	19 9 29.0	7.153
24	5 19 42.77	2.6077	+22 25 14.1	-0.785	24	7 20 15.84	2.3824	+19 2 16.6	-7.260

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			
DECEMBER 19.									DECEMBER 21.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	
0	7	20	15.84	2.3824	+19	2	16.6	-7.259	0	9	7	22.05	2.0882	+11	37	26.0	
1	7	22	38.60	2.3762	18	54	57.9	7.363	1	9	9	27.18	2.0828	11	26	38.9	
2	7	25	0.98	2.3698	18	47	33.0	7.468	2	9	11	31.98	2.0774	11	15	49.3	
3	7	27	22.98	2.3635	18	40	1.8	7.570	3	9	13	36.47	2.0723	11	4	57.3	
4	7	29	44.60	2.3571	18	32	24.6	7.671	4	9	15	40.65	2.0671	10	54	2.9	
5	7	32	5.83	2.3508	18	24	41.3	7.770	5	9	17	44.52	2.0620	10	43	6.2	
6	7	34	26.69	2.3444	18	16	52.2	7.868	6	9	19	48.09	2.0569	10	32	7.4	
7	7	36	47.16	2.3379	18	8	57.1	7.966	7	9	21	51.35	2.0519	10	21	6.4	
8	7	39	7.24	2.3315	18	0	56.3	8.060	8	9	23	54.32	2.0469	10	10	3.3	
9	7	41	26.94	2.3252	17	52	49.9	8.154	9	9	25	56.98	2.0420	9	58	58.1	
10	7	43	46.26	2.3188	17	44	37.8	8.248	10	9	27	59.36	2.0373	9	47	51.0	
11	7	46	5.19	2.3123	17	36	20.2	8.338	11	9	30	1.45	2.0324	9	36	42.0	
12	7	48	23.73	2.3058	17	27	57.2	8.428	12	9	32	3.25	2.0277	9	25	31.2	
13	7	50	41.89	2.2994	17	19	28.8	8.517	13	9	34	4.77	2.0230	9	14	18.6	
14	7	52	59.66	2.2929	17	10	55.2	8.603	14	9	36	6.01	2.0184	9	3	4.3	
15	7	55	17.04	2.2865	17	2	16.5	8.688	15	9	38	6.98	2.0139	8	51	48.3	
16	7	57	34.04	2.2802	16	53	32.6	8.773	16	9	40	7.68	2.0093	8	40	30.8	
17	7	59	50.66	2.2738	16	44	43.7	8.856	17	9	42	8.10	2.0049	8	29	11.7	
18	8	2	6.89	2.2673	16	35	49.9	8.937	18	9	44	8.27	2.0006	8	17	51.1	
19	8	4	22.74	2.2610	16	26	51.3	9.017	19	9	46	8.17	1.9963	8	6	29.2	
20	8	6	38.21	2.2546	16	17	47.9	9.095	20	9	48	7.82	1.9920	7	55	5.8	
21	8	8	53.29	2.2482	16	8	39.9	9.173	21	9	50	7.21	1.9878	7	43	41.2	
22	8	11	7.99	2.2419	15	59	27.2	9.249	22	9	52	6.35	1.9837	7	32	15.2	
23	8	13	22.32	2.2356	+15	50	10.0	-9.323	23	9	54	5.25	1.9797	+7	20	48.1	
DECEMBER 20.									DECEMBER 22.								
0	8	15	36.26	2.2293	+15	40	48.4	-9.396	0	9	56	3.91	1.9757	+7	9	19.9	
1	8	17	49.83	2.2230	15	31	22.5	9.468	1	9	58	2.33	1.9718	6	57	50.6	
2	8	20	3.02	2.2168	15	21	52.3	9.538	2	10	0	0.52	1.9679	6	46	20.2	
3	8	22	15.84	2.2105	15	12	17.9	9.608	3	10	1	58.48	1.9641	6	34	48.9	
4	8	24	28.28	2.2043	15	2	39.4	9.675	4	10	3	56.21	1.9603	6	23	16.6	
5	8	26	40.35	2.1981	14	52	56.9	9.742	5	10	5	53.72	1.9567	6	11	43.5	
6	8	28	52.05	2.1920	14	43	10.4	9.807	6	10	7	51.01	1.9530	6	0	9.6	
7	8	31	3.39	2.1859	14	33	20.1	9.870	7	10	9	48.08	1.9495	5	48	34.8	
8	8	33	14.36	2.1798	14	23	26.0	9.933	8	10	11	44.95	1.9460	5	36	59.4	
9	8	35	24.97	2.1738	14	13	28.2	9.994	9	10	13	41.60	1.9426	5	25	23.3	
10	8	37	35.21	2.1677	14	3	26.7	10.055	10	10	15	38.06	1.9393	5	13	46.5	
11	8	39	45.09	2.1618	13	53	21.6	10.113	11	10	17	34.31	1.9359	5	2	9.2	
12	8	41	54.62	2.1559	13	43	13.1	10.170	12	10	19	30.37	1.9328	4	50	31.4	
13	8	44	3.80	2.1500	13	33	1.2	10.227	13	10	21	26.24	1.9296	4	38	53.1	
14	8	46	12.62	2.1441	13	22	45.9	10.282	14	10	23	21.92	1.9265	4	27	14.3	
15	8	48	21.09	2.1383	13	12	27.4	10.335	15	10	25	17.42	1.9234	4	15	35.2	
16	8	50	29.22	2.1326	13	2	5.7	10.388	16	10	27	12.73	1.9204	4	3	55.7	
17	8	52	37.00	2.1268	12	51	40.9	10.439	17	10	29	7.87	1.9176	3	52	16.0	
18	8	54	44.44	2.1212	12	41	13.0	10.489	18	10	31	2.84	1.9148	3	40	36.0	
19	8	56	51.54	2.1155	12	30	42.2	10.538	19	10	32	57.65	1.9120	3	28	55.8	
20	8	58	58.30	2.1099	12	20	8.5	10.586	20	10	34	52.28	1.9093	3	17	15.4	
21	9	1	4.73	2.1044	12	9	31.9	10.633	21	10	36	46.76	1.9067	3	5	34.9	
22	9	3	10.83	2.0989	11	58	52.6	10.678	22	10	38	41.08	1.9041	2	53	54.4	
23	9	5	16.60	2.0935	11	48	10.6	10.722	23	10	40	35.25	1.9016	2	42	13.8	
24	9	7	22.05	2.0882	+11	37	26.0	-10.764	24	10	42	29.27	1.8992	+2	30	33.3	

GREENWICH MEAN TIME.

Right Ascension.				Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.				Var. per Min.	Declination.	Var. per Min.	
DECEMBER 23.								DECEMBER 25.							
h	m	s	s		"	"		h	m	s	s		"	"	
10	42	29.27	1.8992	+2	30	33.3	-11.675	0	12	12	3.72	1.8572	-6	36 41.6	-10.893
10	44	23.15	1.8968	2	18	52.8	11.673	1	12	13	55.17	1.8578	6	47 34.3	10.863
10	46	16.89	1.8945	2	7	12.5	11.672	2	12	15	46.66	1.8584	6	58 25.2	10.833
10	48	10.49	1.8923	1	55	32.2	11.669	3	12	17	38.18	1.8592	7	9 14.2	10.800
10	50	3.96	1.8901	1	43	52.2	11.665	4	12	19	29.76	1.8600	7	20 1.2	10.768
10	51	57.30	1.8879	1	32	12.4	11.662	5	12	21	21.38	1.8608	7	30 46.4	10.736
10	53	50.51	1.8858	1	20	32.8	11.657	6	12	23	13.06	1.8618	7	41 29.5	10.702
10	55	43.60	1.8839	1	8	53.6	11.651	7	12	25	4.79	1.8628	7	52 10.6	10.668
10	57	36.58	1.8820	0	57	14.7	11.645	8	12	26	56.59	1.8638	8	2 49.6	10.633
10	59	29.44	1.8801	0	45	36.2	11.638	9	12	28	48.44	1.8648	8	13 26.6	10.598
11	1	22.19	1.8783	0	33	58.1	11.631	10	12	30	40.36	1.8660	8	24 1.4	10.563
11	3	14.84	1.8767	0	22	20.5	11.623	11	12	32	32.36	1.8672	8	34 34.1	10.527
11	5	7.39	1.8750	+0	10	43.4	11.613	12	12	34	24.42	1.8683	8	45 4.6	10.490
11	6	59.84	1.8734	-0	0	53.1	11.604	13	12	36	16.56	1.8697	8	55 32.9	10.453
11	8	52.20	1.8719	0	12	29.1	11.594	14	12	38	8.78	1.8710	9	5 58.9	10.414
11	10	44.47	1.8704	0	24	4.4	11.583	15	12	40	1.08	1.8723	9	16 22.6	10.376
11	12	36.65	1.8690	0	35	39.0	11.572	16	12	41	53.46	1.8738	9	26 44.0	10.337
11	14	28.75	1.8677	0	47	13.0	11.560	17	12	43	45.94	1.8754	9	37 3.0	10.297
11	16	20.77	1.8663	0	58	46.2	11.547	18	12	45	38.51	1.8769	9	47 19.6	10.257
11	18	12.71	1.8652	1	10	18.6	11.533	19	12	47	31.17	1.8785	9	57 33.8	10.216
11	20	4.59	1.8641	1	21	50.2	11.520	20	12	49	23.93	1.8802	10	7 45.5	10.175
11	21	56.40	1.8629	1	33	21.0	11.506	21	12	51	16.79	1.8818	10	17 54.8	10.133
11	23	48.14	1.8619	1	44	50.9	11.491	22	12	53	9.75	1.8837	10	28 1.5	10.090
11	25	39.83	1.8610	-1	56	19.9	-11.475	23	12	55	2.83	1.8855	-10	38 5.6	-10.047
DECEMBER 24.								DECEMBER 26.							
11	27	31.46	1.8601	-2	7	47.9	-11.458	0	12	56	56.01	1.8873	-10	48 7.1	-10.003
11	29	23.04	1.8593	2	19	14.9	11.442	1	12	58	49.31	1.8893	10	58 6.0	9.959
11	31	14.58	1.8586	2	30	40.9	11.425	2	13	0	42.72	1.8912	11	8 2.2	9.914
11	33	6.07	1.8578	2	42	5.9	11.407	3	13	2	36.25	1.8932	11	17 55.7	9.868
11	34	57.52	1.8572	2	53	29.7	11.388	4	13	4	29.90	1.8953	11	27 46.4	9.823
11	36	48.93	1.8566	3	4	52.4	11.368	5	13	6	23.68	1.8973	11	37 34.4	9.776
11	38	40.31	1.8561	3	16	13.9	11.348	6	13	8	17.58	1.8995	11	47 19.5	9.728
11	40	31.66	1.8557	3	27	34.2	11.328	7	13	10	11.62	1.9017	11	57 1.8	9.681
11	42	22.99	1.8553	3	38	53.3	11.307	8	13	12	5.78	1.9039	12	6 41.2	9.633
11	44	14.29	1.8549	3	50	11.0	11.285	9	13	14	0.09	1.9063	12	16 17.7	9.583
11	46	5.58	1.8547	4	1	27.5	11.264	10	13	15	54.53	1.9085	12	25 51.2	9.533
11	47	56.85	1.8544	4	12	42.7	11.241	11	13	17	49.11	1.9109	12	35 21.7	9.483
11	49	48.11	1.8543	4	23	56.4	11.218	12	13	19	43.84	1.9133	12	44 49.2	9.433
11	51	39.37	1.8543	4	35	8.8	11.194	13	13	21	38.71	1.9158	12	54 13.6	9.381
11	53	30.62	1.8542	4	46	19.7	11.169	14	13	23	33.73	1.9183	13	3 34.9	9.329
11	55	21.87	1.8542	4	57	29.1	11.144	15	13	25	28.90	1.9208	13	12 53.1	9.277
11	57	13.12	1.8543	5	8	37.0	11.118	16	13	27	24.23	1.9234	13	22 8.1	9.223
11	59	4.38	1.8545	5	19	43.3	11.093	17	13	29	19.71	1.9261	13	31 19.9	9.169
12	0	55.66	1.8547	5	30	48.1	11.067	18	13	31	15.36	1.9288	13	40 28.4	9.115
12	2	46.94	1.8549	5	41	51.3	11.039	19	13	33	11.16	1.9314	13	49 33.7	9.060
12	4	38.25	1.8553	5	52	52.8	11.011	20	13	35	7.13	1.9343	13	58 35.6	9.003
12	6	29.58	1.8557	6	3	52.6	10.983	21	13	37	3.27	1.9370	14	7 34.1	8.947
12	8	20.93	1.8561	6	14	50.7	10.954	22	13	38	59.57	1.9398	14	16 29.2	8.890
12	10	12.31	1.8566	6	25	47.1	10.924	23	13	40	56.05	1.9428	14	25 20.9	8.833
12	12	3.72	1.8572	-6	36	41.6	-10.893	24	13	42	52.70	1.9456	-14	34 9.1	-8.774

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	
DECEMBER 27.					DECEMBER 29.				
	h m s	s	" ' "	"		h m s	s	" ' "	
0	13 42 52.70	1.9456	-14 34 9.1	-8.774	0	15 20 7.83	2.1128	-20 15 21.4	
1	13 44 49.52	1.9486	14 42 53.8	8.715	1	15 22 14.71	2.1164	20 20 29.4	
2	13 46 46.53	1.9516	14 51 34.9	8.655	2	15 24 21.80	2.1200	20 25 31.8	
3	13 48 43.71	1.9545	15 0 12.4	8.595	3	15 26 29.11	2.1238	20 30 28.7	
4	13 50 41.07	1.9576	15 8 46.3	8.534	4	15 28 36.65	2.1274	20 35 20.0	
5	13 52 38.62	1.9607	15 17 16.5	8.473	5	15 30 44.40	2.1310	20 40 5.6	
6	13 54 36.35	1.9638	15 25 43.0	8.410	6	15 32 52.37	2.1346	20 44 45.5	
7	13 56 34.27	1.9669	15 34 5.7	8.347	7	15 35 0.55	2.1382	20 49 19.7	
8	13 58 32.38	1.9701	15 42 24.6	8.283	8	15 37 8.95	2.1418	20 53 48.1	
9	14 0 30.68	1.9733	15 50 39.7	8.219	9	15 39 17.56	2.1453	20 58 10.7	
10	14 2 29.18	1.9766	15 58 50.9	8.154	10	15 41 26.38	2.1488	21 2 27.5	
11	14 4 27.87	1.9798	16 6 58.2	8.089	11	15 43 35.41	2.1523	21 6 38.4	
12	14 6 26.75	1.9831	16 15 1.6	8.023	12	15 45 44.66	2.1559	21 10 43.3	
13	14 8 25.84	1.9864	16 23 0.9	7.955	13	15 47 54.12	2.1593	21 14 42.3	
14	14 10 25.12	1.9898	16 30 56.2	7.888	14	15 50 3.78	2.1627	21 18 35.3	
15	14 12 24.61	1.9932	16 38 47.5	7.820	15	15 52 13.64	2.1662	21 22 22.2	
16	14 14 24.30	1.9965	16 46 34.6	7.750	16	15 54 23.72	2.1696	21 26 3.1	
17	14 16 24.19	1.9999	16 54 17.5	7.681	17	15 56 33.99	2.1729	21 29 37.8	
18	14 18 24.29	2.0034	17 1 56.3	7.611	18	15 58 44.47	2.1763	21 33 6.4	
19	14 20 24.60	2.0068	17 9 30.8	7.540	19	16 0 55.14	2.1795	21 36 28.7	
20	14 22 25.11	2.0103	17 17 1.1	7.468	20	16 3 6.01	2.1828	21 39 44.9	
21	14 24 25.84	2.0139	17 24 27.0	7.395	21	16 5 17.07	2.1860	21 42 54.8	
22	14 26 26.78	2.0174	17 31 48.5	7.323	22	16 7 28.33	2.1893	21 45 58.4	
23	14 28 27.93	2.0209	-17 39 5.7	-7.249	23	16 9 39.78	2.1924	-21 48 55.6	
DECEMBER 28.					DECEMBER 30.				
	h m s	s	" ' "	"		h m s	s	" ' "	
0	14 30 29.29	2.0245	-17 46 18.4	-7.174	0	16 11 51.42	2.1956	-21 51 46.5	
1	14 32 30.87	2.0281	17 53 26.6	7.099	1	16 14 3.25	2.1987	21 54 31.0	
2	14 34 32.66	2.0317	18 0 30.3	7.023	2	16 16 15.26	2.2017	21 57 9.0	
3	14 36 34.67	2.0353	18 7 29.4	6.948	3	16 18 27.45	2.2047	21 59 40.6	
4	14 38 36.90	2.0389	18 14 24.0	6.870	4	16 20 39.82	2.2077	22 2 5.7	
5	14 40 39.34	2.0426	18 21 13.8	6.792	5	16 22 52.37	2.2106	22 4 24.2	
6	14 42 42.01	2.0463	18 27 59.0	6.713	6	16 25 5.09	2.2135	22 6 36.2	
7	14 44 44.89	2.0499	18 34 39.4	6.634	7	16 27 17.99	2.2163	22 8 41.5	
8	14 46 48.00	2.0536	18 41 15.1	6.554	8	16 29 31.05	2.2191	22 10 40.3	
9	14 48 51.32	2.0573	18 47 45.9	6.473	9	16 31 44.28	2.2219	22 12 32.4	
10	14 50 54.87	2.0610	18 54 11.9	6.393	10	16 33 57.68	2.2247	22 14 17.8	
11	14 52 58.64	2.0647	19 0 33.0	6.310	11	16 36 11.24	2.2273	22 15 56.4	
12	14 55 2.63	2.0683	19 6 49.1	6.227	12	16 38 24.95	2.2298	22 17 28.4	
13	14 57 6.84	2.0720	19 13 0.2	6.143	13	16 40 38.82	2.2324	22 18 53.6	
14	14 59 11.27	2.0758	19 19 6.3	6.060	14	16 42 52.84	2.2349	22 20 12.0	
15	15 1 15.93	2.0795	19 25 7.4	5.975	15	16 45 7.01	2.2374	22 21 23.5	
16	15 3 20.81	2.0832	19 31 3.3	5.889	16	16 47 21.33	2.2398	22 22 28.3	
17	15 5 25.91	2.0868	19 36 54.1	5.803	17	16 49 35.78	2.2421	22 23 26.1	
18	15 7 31.23	2.0905	19 42 39.6	5.715	18	16 51 50.38	2.2445	22 24 17.1	
19	15 9 36.77	2.0943	19 48 19.9	5.628	19	16 54 5.12	2.2467	22 25 1.1	
20	15 11 42.54	2.0980	19 53 55.0	5.540	20	16 56 19.98	2.2488	22 25 38.2	
21	15 13 48.53	2.1017	19 59 24.7	5.450	21	16 58 34.98	2.2510	22 26 8.3	
22	15 15 54.74	2.1054	20 4 49.0	5.360	22	17 0 50.10	2.2530	22 26 31.4	
23	15 18 1.18	2.1091	20 10 7.9	5.270	23	17 3 5.34	2.2551	22 26 47.6	
24	15 20 7.83	2.1128	-20 15 21.4	-5.179	24	17 5 20.71	2.2571	-22 26 56.7	

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 31.					DECEMBER 31.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	17 5 20.71	2.2571	-22 26 56.7	-0.093	12	17 32 33.11	2.2759	-22 19 32.2	+1.333
1	17 7 36.19	2.2589	22 26 58.8	+0.024	13	17 34 49.70	2.2771	22 18 8.6	1.453
2	17 9 51.78	2.2608	22 26 53.8	0.143	14	17 37 6.36	2.2782	22 16 37.8	1.574
3	17 12 7.49	2.2627	22 26 41.7	0.260	15	17 39 23.06	2.2792	22 14 59.7	1.694
4	17 14 23.30	2.2643	22 26 22.6	0.378	16	17 41 39.86	2.2802	22 13 14.5	1.814
5	17 16 39.20	2.2659	22 25 56.3	0.498	17	17 43 56.70	2.2811	22 11 22.0	1.935
6	17 18 55.21	2.2676	22 25 22.9	0.616	18	17 46 13.59	2.2819	22 9 22.3	2.056
7	17 21 11.31	2.2691	22 24 42.4	0.735	19	17 48 30.53	2.2827	22 7 15.3	2.177
8	17 23 27.50	2.2707	22 23 54.7	0.855	20	17 50 47.51	2.2834	22 5 1.1	2.297
9	17 25 43.79	2.2721	22 22 59.8	0.974	21	17 53 4.54	2.2841	22 2 39.7	2.418
10	17 28 0.15	2.2733	22 21 57.8	1.093	22	17 55 21.60	2.2847	22 0 11.0	2.538
11	17 30 16.59	2.2747	22 20 48.6	1.213	23	17 57 38.70	2.2853	21 57 35.1	2.658
12	17 32 33.11	2.2759	-22 19 32.2	+1.333	24	17 59 55.83	2.2857	-21 54 52.0	+2.779

PHASES OF THE MOON.

(Last Quarter	Jan.	d h m	4 23 49.6	Apr.	d h m	4 1 33.1	June	d h m	30 20 42.9	Sept.	d h m	26 16 38.6
● New Moon			12 10 35.8			10 16 34.8	July		7 20 22.1	Oct.		4 15 5.2
) First Quarter			19 2 37.9			17 16 7.7			15 18 24.7			12 17 0.0
○ Full Moon			26 15 14.2			25 20 5.4			23 8 34.8			19 9 34.8
(Last Quarter	Feb.		3 19 52.0	May		3 10 26.2			30 1 13.9			26 5 35.4
● New Moon			10 22 4.6			10 1 0.9	Aug.		6 8 29.6	Nov.		3 9 1.6
) First Quarter			17 12 56.9			17 8 14.3			14 11 16.4			11 4 46.2
○ Full Moon			25 9 34.6			25 10 32.4			21 17 2.3			17 19 33.0
(Last Quarter	Mar.		5 12 43.6	June		1 16 20.0			28 7 27.1			24 22 25.3
● New Moon			12 7 52.4			8 10 2.7	Sept.		4 22 43.7	Dec.		3 3 19.3
) First Quarter			19 1 30.4			16 1 11.7			13 3 2.3			10 14 31.4
○ Full Moon			27 3 32.8			23 22 38.3			20 1 0.9			17 7 17.5
(Last Quarter	Apr.		4 1 33.1			30 20 42.9			26 16 38.6			24 18 30.6
● New Moon			10 16 34.3	July		7 20 22.1	Oct.		4 15 5.2			

APOGEE.

	d h		d h
January	2 23.4	July	14 15.3
January	30 17.8	August	11 9.1
February	27 2.9	September	7 23.7
March	26 3.2	October	5 6.4
April	22 11.1	November	1 8.1
May	20 2.5	November	28 19.2
June	16 20.6	December	26 13.9

PERIGEE.

	d h		d h
January	14 17.0	July	26 14.4
February	11 23.3	August	23 9.8
March	12 10.8	September	20 16.9
April	9 21.8	October	19 4.3
May	8 4.0	November	16 15.5
June	4 19.5	December	14 20.4
June	30 11.5		

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.		
		" " "	" " "	" "	" "	"	d			h m
Jan.	1.0	146 48 15.4	-4 20 34.5	14 51.9	54 27.63	-0.726	18.1	Jan.	1	L 3 14.3
	1.5	152 47 39.2	4 37 53.2	14 49.8	54 19.89	0.563	18.6		1	U 15 35.0
	2.0	158 45 26.6	4 52 6.1	14 48.3	54 14.17	0.385	19.1		2	L 3 55.4
	2.5	164 42 5.1	5 3 7.5	14 47.3	54 10.70	-0.192	19.6		2	U 16 15.6
	3.0	170 38 4.1	5 10 53.0	14 47.0	54 9.60	+0.011	20.1		3	L 4 35.8
	3.5	176 33 55.4	-5 15 19.3	14 47.4	54 11.00	+0.224	20.6		3	U 16 56.0
	4.0	182 30 11.8	5 16 23.9	14 48.5	54 14.99	0.440	21.1		4	L 5 16.4
	4.5	188 27 28.3	5 14 5.1	14 50.3	54 21.57	0.658	21.6		4	U 17 37.1
	5.0	194 26 19.9	5 8 21.9	14 52.8	54 30.80	0.880	22.1		5	L 5 58.3
	5.5	200 27 22.4	4 59 14.3	14 56.0	54 42.67	1.096	22.6		5	U 18 20.0
	6.0	206 31 11.5	-4 46 43.1	15 0.0	54 57.06	+1.302	23.1		6	L 6 42.5
	6.5	212 38 22.2	4 30 50.4	15 4.5	55 13.86	1.496	23.6		6	U 19 5.7
	7.0	218 49 28.0	4 11 39.6	15 9.7	55 32.89	1.673	24.1		7	L 7 29.8
	7.5	225 5 0.5	3 49 16.0	15 15.5	55 53.93	1.828	24.6		7	U 19 54.8
	8.0	231 25 28.4	3 23 47.5	15 21.6	56 16.66	1.956	25.1		8	L 8 20.8
	8.5	237 51 16.8	-2 55 24.4	15 28.2	56 40.76	+2.054	25.6		8	U 20 47.8
	9.0	244 22 45.7	2 24 20.5	15 35.1	57 5.81	2.113	26.1		9	L 9 15.6
	9.5	251 0 10.0	1 50 53.3	15 42.0	57 31.31	2.132	26.6		9	U 21 44.1
	10.0	257 43 37.7	1 15 24.7	15 48.9	57 56.81	2.107	27.1		10	L 10 13.2
	10.5	264 33 9.8	0 38 20.7	15 55.7	58 21.68	2.032	27.6		10	U 22 42.7
	11.0	271 28 38.5	-0 0 12.0	16 2.2	58 45.40	+1.912	28.1		11	L 11 12.2
	11.5	278 29 48.1	+0 38 26.7	16 8.2	59 7.40	1.746	28.6		11	U 23 41.7
	12.0	285 36 14.0	1 16 56.9	16 13.6	59 27.14	1.538	29.1			.....
	12.5	292 47 23.1	1 54 37.8	16 18.2	59 44.17	1.294	0.1	12	L	12 10.9
	13.0	300 2 34.8	2 30 47.2	16 22.0	59 58.07	1.019	0.6	13	U	0 39.6
	13.5	307 21 1.6	+3 4 43.0	16 24.9	60 8.56	+0.727	1.1	13	L	13 7.7
	14.0	314 41 50.7	3 35 45.1	16 26.7	60 15.48	0.425	1.6	14	U	1 35.3
	14.5	322 4 6.9	4 3 16.8	16 27.6	60 18.77	+0.125	2.1	14	L	14 2.3
	15.0	329 26 53.1	4 26 46.4	16 27.6	60 18.53	-0.164	2.6	15	U	2 28.7
	15.5	336 49 13.5	4 45 48.2	16 26.6	60 14.92	0.433	3.1	15	L	14 54.7
	16.0	344 10 15.6	+5 0 3.6	16 24.8	60 8.25	-0.674	3.6	16	U	3 20.4
	16.5	351 29 11.9	5 9 21.0	16 22.2	59 58.87	0.883	4.1	16	L	15 45.9
	17.0	358 45 20.8	5 13 36.1	16 19.0	59 47.19	1.058	4.6	17	U	4 11.3
	17.5	5 58 8.3	5 12 50.8	16 15.3	59 33.62	1.198	5.1	17	L	16 36.7
	18.0	13 7 7.9	5 7 13.6	16 11.2	59 18.58	1.304	5.6	18	U	5 2.2
	18.5	20 12 0.7	+4 56 57.9	16 6.8	59 2.46	-1.378	6.1	18	L	17 28.1
	19.0	27 12 34.9	4 42 21.3	16 2.3	58 45.63	1.424	6.6	19	U	5 54.2
	19.5	34 8 45.2	4 23 44.8	15 57.6	58 28.38	1.446	7.1	19	L	18 20.7
	20.0	41 0 31.7	4 1 32.0	15 52.8	58 11.00	1.450	7.6	20	U	6 47.5
	20.5	47 47 58.8	3 36 8.4	15 48.1	57 53.65	1.439	8.1	20	L	19 14.7
	21.0	54 31 14.5	+3 8 0.8	15 43.4	57 36.52	-1.415	8.6	21	U	7 42.2
	21.5	61 10 29.1	2 37 36.7	15 38.8	57 19.72	1.384	9.1	21	L	20 9.8
	22.0	67 45 54.3	2 5 24.0	15 34.4	57 3.32	1.349	9.6	22	U	8 37.5
	22.5	74 17 42.4	1 31 50.9	15 30.0	56 47.35	1.310	10.1	22	L	21 5.1
	23.0	80 46 5.9	0 57 25.2	15 25.8	56 31.87	1.271	10.6	23	U	9 32.3
	23.5	87 11 16.6	+0 22 34.0	15 21.7	56 16.85	-1.230	11.1	23	L	21 59.2
	24.0	93 33 25.7	-0 12 16.0	15 17.8	56 2.34	-1.189	11.6	24	U	10 25.5

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	" ' "	" ' "	" "	" "	"	d			h m	m	
Jan. 24.0	93 33 25.7	-0 12 16.0	15 17.8	56 2.34	-1.189	11.6	Jan. 24	U	10 25.5	2.16	
24.5	99 52 43.2	0 46 39.4	15 13.9	55 48.31	1.147	12.1	24	L	22 51.1	2.11	
25.0	106 9 18.3	1 20 11.7	15 10.3	55 34.82	1.102	12.6	25	U	11 16.1	2.05	
25.5	112 23 19.1	1 52 30.1	15 6.7	55 21.88	1.055	13.1	25	L	23 40.3	1.98	
26.0	118 34 53.2	2 23 13.5	15 3.4	55 9.52	1.002	13.6			.....	...
26.5	124 44 8.1	-2 52 2.5	15 0.2	54 57.86	-0.941	14.1	26	U	12 3.7	1.92	
27.0	130 51 10.8	3 18 39.8	14 57.2	54 46.96	0.874	14.6	27	L	0 26.5	1.87	
27.5	136 56 8.7	3 42 49.9	14 54.5	54 36.93	0.796	15.1	27	U	12 48.6	1.82	
28.0	142 59 10.5	4 4 19.7	14 52.0	54 27.89	0.708	15.6	28	L	1 10.2	1.78	
28.5	149 0 25.5	4 22 58.3	14 49.9	54 19.98	0.607	16.1	28	U	13 31.3	1.74	
29.0	155 0 4.8	-4 38 36.4	14 48.1	54 13.37	-0.493	16.6	29	L	1 52.0	1.71	
29.5	160 58 21.3	4 51 7.1	14 46.7	54 8.20	0.368	17.1	29	U	14 12.4	1.69	
30.0	166 55 30.1	5 0 25.1	14 45.7	54 4.61	0.228	17.6	30	L	2 32.6	1.68	
30.5	172 51 48.7	5 6 26.7	14 45.2	54 2.80	-0.073	18.1	30	U	14 52.8	1.69	
31.0	178 47 37.0	5 9 9.9	14 45.2	54 2.90	+0.092	18.6	31	L	3 13.1	1.69	
31.5	184 43 17.7	-5 8 33.9	14 45.8	54 5.07	+0.270	19.1	31	U	15 33.5	1.71	
Feb. 1.0	190 39 15.8	5 4 38.9	14 47.0	54 9.43	0.459	19.6	Feb. 1	L	3 54.2	1.74	
1.5	196 35 59.3	4 57 26.5	14 48.8	54 16.12	0.657	20.1	1	U	16 15.2	1.77	
2.0	202 33 58.4	4 46 59.1	14 51.3	54 25.22	0.859	20.6	2	L	4 36.8	1.82	
2.5	208 33 45.4	4 33 20.0	14 54.4	54 36.76	1.066	21.1	2	U	16 59.0	1.88	
3.0	214 35 54.6	-4 16 33.6	14 58.3	54 50.81	+1.275	21.6	3	L	5 21.9	1.94	
3.5	220 41 1.5	3 56 45.5	15 2.8	55 7.34	1.479	22.1	3	U	17 45.5	2.00	
4.0	226 49 42.7	3 34 2.7	15 7.9	55 26.28	1.676	22.6	4	L	6 10.0	2.08	
4.5	233 2 34.8	3 8 33.6	15 13.7	55 47.51	1.861	23.1	4	U	18 35.4	2.15	
5.0	239 20 14.2	2 40 28.7	15 20.1	56 10.87	2.030	23.6	5	L	7 1.6	2.22	
5.5	245 43 15.6	-2 10 1.0	15 27.0	56 36.12	+2.174	24.1	5	U	19 28.7	2.29	
6.0	252 12 10.9	1 37 26.0	15 34.3	57 2.92	2.288	24.6	6	L	7 56.5	2.34	
6.5	258 47 28.6	1 3 2.9	15 41.9	57 30.88	2.365	25.1	6	U	20 24.9	2.39	
7.0	265 29 31.5	-0 27 14.3	15 49.7	57 59.52	2.400	25.6	7	L	8 53.7	2.41	
7.5	272 18 35.4	+0 9 32.9	15 57.5	58 28.29	2.386	26.1	7	U	21 22.8	2.43	
8.0	279 14 47.8	+0 46 47.7	16 5.2	58 56.57	+2.317	26.6	8	L	9 51.9	2.43	
8.5	286 18 6.2	1 23 55.2	16 12.6	59 23.67	2.190	27.1	8	U	22 21.0	2.41	
9.0	293 28 16.5	2 0 16.6	16 19.5	59 48.91	2.005	27.6	9	L	10 49.8	2.38	
9.5	300 44 52.4	2 35 10.6	16 25.7	60 11.57	1.762	28.1	9	U	23 18.2	2.35	
10.0	308 7 14.9	3 7 54.7	16 31.0	60 30.99	1.468	28.6	10	L	11 46.3	2.32	
10.5	315 34 32.6	+3 37 46.2	16 35.2	60 46.63	+1.130	29.1			.....	...
11.0	323 5 43.1	4 4 4.9	16 38.3	60 57.99	0.759	0.1	11	U	0 13.9	2.28	
11.5	330 39 35.0	4 26 14.8	16 40.2	61 4.78	+0.370	0.6	11	L	12 41.1	2.25	
12.0	338 14 50.6	4 43 46.2	16 40.7	61 6.86	-0.024	1.1	12	U	1 8.0	2.24	
12.5	345 50 9.6	4 56 16.9	16 40.0	61 4.23	0.411	1.6	12	L	13 34.7	2.22	
13.0	353 24 12.4	+5 3 33.6	16 38.1	60 57.09	-0.772	2.1	13	U	2 1.2	2.21	
13.5	0 55 44.2	5 5 31.8	16 35.0	60 45.85	1.096	2.6	13	L	14 27.7	2.21	
14.0	8 23 37.9	5 2 15.9	16 31.0	60 30.94	1.380	3.1	14	U	2 54.2	2.22	
14.5	15 46 56.6	4 53 58.2	16 26.0	60 12.92	1.614	3.6	14	L	15 20.9	2.23	
15.0	23 4 55.3	4 40 57.7	16 20.5	59 52.42	1.795	4.1	15	U	3 47.8	2.25	
15.5	30 17 1.3	+4 23 38.5	16 14.4	59 30.05	-1.924	4.6	15	L	16 14.9	2.27	
16.0	37 22 54.3	+4 2 28.3	16 7.9	59 6.44	-2.004	5.1	16	U	4 42.3	2.29	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
									h m	m	
Feb. 16.0	37 22 54.3	+4 2 28.3	16 7.9	59 6.44	-2.004	5.1	Feb. 16	U	4 42.3	2.29	
16.5	44 22 25.3	3 37 57.3	16 1.3	58 42.12	2.041	5.6	16	L	17 9.9	2.31	
17.0	51 15 35.5	3 10 36.4	15 54.6	58 17.62	2.035	6.1	17	U	5 37.7	2.33	
17.5	58 2 34.6	2 40 57.0	15 48.0	57 53.40	1.998	6.6	17	L	18 5.7	2.33	
18.0	64 43 38.7	2 9 29.8	15 41.6	57 29.76	1.937	7.1	18	U	6 33.5	2.31	
18.5	71 19 9.2	+1 36 44.3	15 35.4	57 7.01	-1.852	7.6	18	L	19 1.2	2.29	
19.0	77 49 30.7	1 3 8.8	15 29.5	56 45.37	1.754	8.1	19	U	7 28.5	2.26	
19.5	84 15 9.9	+0 29 9.9	15 23.9	56 24.96	1.646	8.6	19	L	19 55.5	2.23	
20.0	90 36 34.1	-0 4 47.2	15 18.7	56 5.90	1.531	9.1	20	U	8 21.9	2.18	
20.5	96 54 10.7	0 38 18.8	15 13.9	55 48.22	1.414	9.6	20	L	20 47.7	2.12	
21.0	103 8 25.7	-1 11 2.7	15 9.5	55 31.96	-1.296	10.1	21	U	9 12.8	2.05	
21.5	109 19 43.7	1 42 38.1	15 5.4	55 17.11	1.181	10.6	21	L	21 37.1	2.00	
22.0	115 28 27.5	2 12 45.9	15 1.7	55 3.61	1.070	11.1	22	U	10 0.8	1.95	
22.5	121 34 57.2	2 41 8.0	14 58.4	54 51.43	0.960	11.6	22	L	22 23.8	1.89	
23.0	127 39 30.9	3 7 28.1	14 55.5	54 40.56	0.853	12.1	23	U	10 46.1	1.84	
23.5	133 42 24.1	-3 31 31.2	14 52.8	54 30.94	-0.752	12.6	23	L	23 7.9	1.79	
24.0	139 43 50.8	3 53 3.7	14 50.6	54 22.50	0.653	13.1	24	U	11 29.2	1.76	
24.5	145 44 2.8	4 11 54.2	14 48.6	54 15.26	0.553	13.6	24	L	23 50.1	1.73	
25.0	151 43 10.6	4 27 52.3	14 46.9	54 9.22	0.453	14.1			.....	...
25.5	157 41 23.9	4 40 49.9	14 45.6	54 4.38	0.353	14.6	25	U	12 10.7	1.71	
26.0	163 38 51.7	-4 50 40.2	14 44.6	54 0.75	-0.250	15.1	26	L	0 31.1	1.69	
26.5	169 35 43.4	4 57 18.6	14 44.0	53 58.39	0.142	15.6	26	U	12 51.3	1.69	
27.0	175 32 8.7	5 0 42.0	14 43.7	53 57.37	-0.027	16.1	27	L	1 11.6	1.69	
27.5	181 28 18.4	5 0 48.9	14 43.8	53 57.76	+0.093	16.6	27	U	13 31.9	1.70	
28.0	187 24 24.6	4 57 39.8	14 44.3	53 59.64	0.222	17.1	28	L	1 52.5	1.72	
28.5	193 20 41.7	-4 51 16.6	14 45.3	54 3.13	+0.361	17.6	28	U	14 13.3	1.75	
Mar. 1.0	199 17 26.0	4 41 42.3	14 46.7	54 8.34	0.508	18.1	Mar. 1	L	2 34.5	1.78	
1.5	205 14 56.4	4 29 1.9	14 48.6	54 15.35	0.663	18.6	1	U	14 56.1	1.83	
2.0	211 13 34.8	4 13 21.3	14 51.0	54 24.28	0.827	19.1	2	L	3 18.4	1.88	
2.5	217 13 45.5	3 54 47.6	14 54.0	54 35.22	0.998	19.6	2	U	15 41.2	1.93	
3.0	223 15 55.6	-3 33 29.3	14 57.6	54 48.25	+1.175	20.1	3	L	4 4.7	1.99	
3.5	229 20 35.1	3 9 36.1	15 1.7	55 3.42	1.354	20.6	3	U	16 28.9	2.05	
4.0	235 28 16.0	2 43 19.0	15 6.4	55 20.75	1.533	21.1	4	L	4 53.9	2.11	
4.5	241 39 32.3	2 14 50.7	15 11.7	55 40.21	1.709	21.6	4	U	17 19.6	2.17	
5.0	247 54 59.0	1 44 25.5	15 17.6	56 1.74	1.879	22.1	5	L	5 46.0	2.22	
5.5	254 15 12.2	-1 12 19.6	15 24.0	56 25.24	+2.035	22.6	5	U	18 12.9	2.27	
6.0	260 40 47.2	0 38 51.8	15 30.9	56 50.52	2.174	23.1	6	L	6 40.4	2.31	
6.5	267 12 17.8	-0 4 23.2	15 38.2	57 17.33	2.289	23.6	6	U	19 8.2	2.33	
7.0	273 50 15.1	+0 30 41.9	15 45.8	57 45.33	2.371	24.1	7	L	7 36.2	2.34	
7.5	280 35 5.1	1 5 56.3	15 53.7	58 14.09	2.416	24.6	7	U	20 4.4	2.35	
8.0	287 27 7.7	+1 40 49.4	16 1.6	58 43.12	+2.414	25.1	8	L	8 32.5	2.34	
8.5	294 26 34.6	2 14 47.5	16 9.4	59 11.80	2.359	25.6	8	U	21 0.5	2.33	
9.0	301 33 27.0	2 47 14.2	16 16.9	59 39.51	2.247	26.1	9	L	9 28.3	2.31	
9.5	308 47 33.6	3 17 31.1	16 24.0	60 5.48	2.071	26.6	9	U	21 55.9	2.29	
10.0	316 8 29.5	3 44 58.8	16 30.4	60 28.98	1.835	27.1	10	L	10 23.2	2.27	
10.5	323 35 35.5	+4 8 58.8	16 36.0	60 49.29	+1.542	27.6	10	U	22 50.4	2.26	
11.0	331 7 57.8	+4 28 54.9	16 40.5	61 5.78	+1.198	28.1	11	L	11 17.5	2.25	

GREENWICH MEAN TIME.

i. M. T.	Longitude.			Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	°	'	"							h	m	
r. 10.0	316	8	29.5	+3 44 58.8	16 30.4	60 28.98	+1.835	27.1	Mar. 10	L	10 23.2	2.27
10.5	323	35	35.5	4 8 58.8	16 36.0	60 49.29	1.542	27.6	10	U	22 50.4	2.26
11.0	331	7	57.8	4 28 54.9	16 40.5	61 5.78	1.198	28.1	11	L	11 17.5	2.25
11.5	338	44	29.0	4 44 15.6	16 43.7	61 17.85	0.807	28.6	11	U	23 44.5	2.25
12.0	346	23	50.5	4 54 35.7	16 45.7	61 25.03	+0.387	29.1			.....	...
12.5	354	4	35.9	+4 59 38.5	16 46.3	61 27.08	-0.046	0.2	12	L	12 11.5	2.26
13.0	1	45	14.3	4 59 16.4	16 45.4	61 23.95	0.474	0.7	13	U	0 38.7	2.27
13.5	9	24	15.8	4 53 31.8	16 43.2	61 15.77	0.885	1.2	13	L	13 6.0	2.29
14.0	17	0	14.9	4 42 36.3	16 39.6	61 2.85	1.262	1.7	14	U	1 33.6	2.32
14.5	24	31	54.9	4 26 50.3	16 35.0	60 45.68	1.592	2.2	14	L	14 1.6	2.34
15.0	31	58	11.1	+4 6 41.4	16 29.3	60 24.86	-1.868	2.7	15	U	2 29.8	2.37
15.5	39	18	12.3	3 42 41.8	16 22.8	60 1.09	2.083	3.2	15	L	14 58.4	2.39
16.0	46	31	22.0	3 15 27.3	16 15.7	59 35.10	2.240	3.7	16	U	3 27.2	2.41
16.5	53	37	18.2	2 45 34.8	16 8.2	59 7.57	2.337	4.2	16	L	15 56.1	2.41
17.0	60	35	52.1	2 13 41.3	16 0.5	58 39.24	2.376	4.7	17	U	4 25.0	2.40
17.5	67	27	7.0	+1 40 22.4	15 52.7	58 10.74	-2.367	5.2	17	L	16 53.7	2.38
18.0	74	11	16.1	1 6 11.4	15 45.1	57 42.60	2.317	5.7	18	U	5 22.0	2.34
18.5	80	48	40.4	+0 31 39.3	15 37.6	57 15.27	2.231	6.2	18	L	17 49.9	2.30
19.0	87	19	46.9	-0 2 45.6	15 30.5	56 49.17	2.114	6.7	19	U	6 17.1	2.24
19.5	93	45	6.8	0 36 38.1	15 23.8	56 24.61	1.978	7.2	19	L	18 43.7	2.18
20.0	100	5	13.8	-1 9 35.4	15 17.6	56 1.77	-1.826	7.7	20	U	7 9.4	2.11
20.5	106	20	42.7	1 41 17.1	15 11.9	55 40.82	1.664	8.2	20	L	19 34.4	2.05
21.0	112	32	8.4	2 11 25.1	15 6.7	55 21.86	1.497	8.7	21	U	7 58.5	1.98
21.5	118	40	5.0	2 39 43.0	15 2.1	55 4.90	1.328	9.2	21	L	20 21.9	1.92
22.0	124	45	5.1	3 5 56.1	14 58.0	54 49.99	1.158	9.7	22	U	8 44.5	1.86
22.5	130	47	39.1	-3 29 51.1	14 54.5	54 37.09	-0.993	10.2	22	L	21 6.6	1.82
23.0	136	48	15.1	3 51 16.3	14 51.5	54 26.13	0.837	10.7	23	U	9 28.1	1.77
23.5	142	47	18.4	4 10 1.2	14 49.0	54 16.99	0.685	11.2	23	L	21 49.1	1.74
24.0	148	45	11.6	4 25 56.5	14 47.1	54 9.67	0.539	11.7	24	U	10 9.8	1.71
24.5	154	42	14.6	4 38 54.2	14 45.5	54 4.03	0.402	12.2	24	L	22 30.2	1.70
25.0	160	38	44.8	-4 48 47.8	14 44.4	53 59.99	-0.272	12.7	25	U	10 50.6	1.69
25.5	166	34	57.3	4 55 32.0	14 43.7	53 57.47	0.148	13.2	25	L	23 10.8	1.69
26.0	172	31	4.8	4 59 2.9	14 43.4	53 56.39	-0.032	13.7	26	U	11 31.1	1.70
26.5	178	27	18.8	4 59 18.7	14 43.5	53 56.68	+0.081	14.2	26	L	23 51.6	1.72
27.0	184	23	49.7	4 56 18.6	14 44.0	53 58.31	0.189	14.7			.....	...
27.5	190	20	46.8	-4 50 3.9	14 44.7	54 1.21	+0.295	15.2	27	U	12 12.3	1.74
28.0	196	18	19.7	4 40 37.5	14 45.9	54 5.40	0.403	15.7	28	L	0 33.4	1.77
28.5	202	16	38.0	4 28 4.0	14 47.4	54 10.89	0.510	16.2	28	U	12 54.8	1.81
29.0	208	15	52.4	4 12 29.7	14 49.2	54 17.65	0.619	16.7	29	L	1 16.8	1.85
29.5	214	16	14.8	3 54 2.6	14 51.4	54 25.75	0.731	17.2	29	U	13 39.3	1.90
30.0	220	17	58.8	-3 32 52.3	14 54.0	54 35.21	+0.848	17.7	30	L	2 2.4	1.95
30.5	226	21	20.1	3 9 10.0	14 57.0	54 46.11	0.969	18.2	30	U	14 26.2	2.01
31.0	232	26	36.8	2 43 8.6	15 0.4	54 58.49	1.095	18.7	31	L	2 50.6	2.06
31.5	238	34	9.3	2 15 2.2	15 4.1	55 12.40	1.223	19.2	31	U	15 15.6	2.11
vr. 1.0	244	44	20.5	1 45 6.4	15 8.3	55 27.84	1.353	19.7	Apr. 1	L	3 41.3	2.16
1.5	250	57	35.7	-1 13 38.6	15 13.0	55 44.89	+1.488	20.2	1	U	16 7.4	2.20
2.0	257	14	22.1	-0 40 57.7	15 18.1	56 3.53	+1.619	20.7	2	L	4 34.0	2.23

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		" " "	" " "	" "	" "	"	d			h m	m	
Apr.	1.0	244 44 20.5	-1 45 6.4	15 8.3	55 27.84	+1.353	19.7	Apr.	1	L	3 41.3	2.16
	1.5	250 57 35.7	1 13 38.6	15 13.0	55 44.89	1.488	20.2		1	U	16 7.4	2.20
	2.0	257 14 22.1	0 40 57.7	15 18.1	56 3.53	1.619	20.7		2	L	4 34.0	2.23
	2.5	263 35 8.6	-0 7 24.0	15 23.6	56 23.72	1.746	21.2		2	U	17 0.8	2.25
	3.0	270 0 24.6	+0 26 40.4	15 29.5	56 45.39	1.864	21.7		3	L	5 27.9	2.26
	3.5	276 30 39.6	+1 0 51.1	15 35.8	57 8.40	+1.968	22.2		3	U	17 55.1	2.26
	4.0	283 6 22.1	1 34 42.0	15 42.3	57 32.55	2.055	22.7		4	L	6 22.2	2.25
	4.5	289 47 58.2	2 7 45.2	15 49.2	57 57.62	2.118	23.2		4	U	18 49.2	2.25
	5.0	296 35 49.8	2 39 30.5	15 56.2	58 23.25	2.148	23.7		5	L	7 16.1	2.23
	5.5	303 30 13.3	3 9 26.3	16 3.2	58 49.02	2.141	24.2		5	U	19 42.8	2.22
	6.0	310 31 17.8	+3 36 59.4	16 10.1	59 14.47	+2.093	24.7		6	L	8 9.4	2.21
	6.5	317 39 2.9	4 1 36.3	16 16.8	59 39.04	1.993	25.2		6	U	20 35.8	2.19
	7.0	324 53 17.2	4 22 43.8	16 23.1	60 2.09	1.840	25.7		7	L	9 2.1	2.19
	7.5	332 13 36.8	4 39 50.0	16 28.8	60 22.99	1.634	26.2		7	U	21 28.4	2.19
	8.0	339 39 24.8	4 52 26.8	16 33.7	60 41.10	1.374	26.7		8	L	9 54.8	2.21
	8.5	347 9 51.2	+5 0 10.4	16 37.7	60 55.77	+1.065	27.2		8	U	22 21.4	2.23
	9.0	354 43 53.7	5 2 43.6	16 40.6	61 6.46	0.712	27.7		9	L	10 48.4	2.26
	9.5	2 20 19.6	4 59 57.0	16 42.3	61 12.73	+0.328	28.2		9	U	23 15.6	2.29
	10.0	9 57 49.0	4 51 50.3	16 42.8	61 14.25	-0.075	28.7		10	L	11 43.4	2.34
	10.5	17 34 58.0	4 38 32.1	16 41.8	61 10.92	0.480	29.2			.....	....
	11.0	25 10 22.8	+4 20 20.5	16 39.6	61 2.77	-0.876	0.3		11	U	0 11.7	2.38
	11.5	32 42 43.7	3 57 41.6	16 36.2	60 50.00	1.245	0.8		11	L	12 40.4	2.41
	12.0	40 10 48.6	3 31 8.2	16 31.5	60 33.06	1.573	1.3		12	U	1 9.6	2.45
	12.5	47 33 35.7	3 1 17.8	16 25.9	60 12.44	1.855	1.8		12	L	13 39.2	2.48
	13.0	54 50 15.8	2 28 50.9	16 19.5	59 48.75	2.082	2.3		13	U	2 9.0	2.49
	13.5	62 0 12.5	+1 54 28.7	16 12.4	59 22.71	-2.249	2.8		13	L	14 38.9	2.49
	14.0	69 3 3.0	1 18 51.7	16 4.8	58 55.01	2.357	3.3		14	U	3 8.6	2.46
	14.5	75 58 37.3	0 42 38.0	15 57.0	58 26.37	2.408	3.8		14	L	15 37.9	2.42
	15.0	82 46 56.5	+0 6 23.2	15 49.1	57 57.44	2.406	4.3		15	U	4 6.6	2.36
	15.5	89 28 11.7	-0 29 21.4	15 41.3	57 28.81	2.359	4.8		15	L	16 34.6	2.30
	16.0	96 2 42.2	-1 4 7.9	15 33.7	57 0.99	-2.272	5.3		16	U	5 1.7	2.22
	16.5	102 30 53.4	1 37 32.1	15 26.5	56 34.43	2.150	5.8		16	L	17 27.9	2.15
	17.0	108 53 15.6	2 9 13.4	15 19.7	56 9.50	2.002	6.3		17	U	5 53.2	2.07
	17.5	115 10 22.5	2 38 54.1	15 13.4	55 46.46	1.835	6.8		17	L	18 17.5	1.99
	18.0	121 22 49.7	3 6 19.4	15 7.7	55 25.53	1.652	7.3		18	U	6 41.0	1.92
	18.5	127 31 13.4	-3 31 16.5	15 2.6	55 6.85	-1.459	7.8		18	L	19 3.7	1.87
	19.0	133 36 10.2	3 53 35.0	14 58.2	54 50.53	1.291	8.3		19	U	7 25.8	1.81
	19.5	139 38 15.7	4 13 5.8	14 54.4	54 36.59	1.082	8.8		19	L	19 47.2	1.77
	20.0	145 38 4.1	4 29 41.1	14 51.2	54 25.02	0.866	9.3		20	U	8 8.2	1.73
	20.5	151 36 8.0	4 43 14.4	14 48.7	54 15.78	0.674	9.8		20	L	20 28.8	1.71
	21.0	157 32 57.6	-4 53 40.4	14 46.8	54 8.82	-0.488	10.3		21	U	8 49.2	1.69
	21.5	163 29 1.0	5 0 54.8	14 45.5	54 4.02	0.312	10.8		21	L	21 9.5	1.69
	22.0	169 24 43.5	5 4 54.2	14 44.8	54 1.29	-0.145	11.3		22	U	9 29.8	1.69
	22.5	175 20 27.8	5 5 36.7	14 44.6	54 0.50	+0.011	11.8		22	L	21 50.2	1.70
	23.0	181 16 34.0	5 3 1.3	14 44.8	54 1.51	0.156	12.3		23	U	10 10.7	1.72
	23.5	187 13 20.1	-4 57 8.5	14 45.6	54 4.20	+0.290	12.8		23	L	22 31.6	1.76
	24.0	193 11 1.4	-4 48 0.1	14 46.7	54 8.43	+0.413	13.3		24	U	10 52.9	1.79

GREENWICH MEAN TIME.

J. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
									h m	m	
r. 24.0	193 11 1.4	-4 48 0.1	14 46.7	54 8.43	+0.413	13.3	Apr. 24	U	10 52.9	1.79	
24.5	199 9 51.4	4 35 39.9	14 48.3	54 14.07	0.525	13.8	24	L	23 14.6	1.84	
25.0	205 10 1.9	4 20 13.2	14 50.1	54 21.00	0.629	14.3	25	U	11 37.0	1.89	
25.5	211 11 43.2	4 1 47.3	14 52.4	54 29.12	0.722	14.8	25	L	23 59.9	1.93	
26.0	217 15 5.0	3 40 31.3	14 54.9	54 38.30	0.808	15.3			.....	...
26.5	223 20 16.4	-3 16 36.5	14 57.6	54 48.49	+0.889	15.8	26	U	12 23.4	1.99	
27.0	229 27 26.1	2 50 16.1	15 0.7	54 59.62	0.965	16.3	27	L	0 47.7	2.05	
27.5	235 36 43.7	2 21 45.2	15 3.9	55 11.64	1.038	16.8	27	U	13 12.5	2.10	
28.0	241 48 19.1	1 51 20.8	15 7.4	55 24.52	1.107	17.3	28	L	1 38.0	2.15	
28.5	248 2 23.1	1 19 21.9	15 11.2	55 38.20	1.174	17.8	28	U	14 4.0	2.18	
29.0	254 19 8.2	-0 46 9.1	15 15.1	55 52.70	+1.242	18.3	29	L	2 30.4	2.21	
29.5	260 38 47.9	-0 12 4.5	15 19.3	56 8.01	1.310	18.8	29	U	14 57.1	2.24	
30.0	267 1 37.4	+0 22 28.2	15 23.7	56 24.12	1.375	19.3	30	L	3 24.0	2.24	
30.5	273 27 52.8	0 57 4.0	15 28.3	56 41.00	1.439	19.8	30	U	15 50.9	2.24	
ay 1.0	279 57 50.9	1 31 16.9	15 33.1	56 58.64	1.500	20.3	May 1	L	4 17.7	2.23	
1.5	286 31 49.4	+2 4 39.7	15 38.1	57 16.97	+1.554	20.8	1	U	16 44.4	2.21	
2.0	293 10 5.4	2 36 44.2	15 43.3	57 35.90	1.600	21.3	2	L	5 10.8	2.19	
2.5	299 52 54.9	3 7 1.9	15 48.5	57 55.31	1.633	21.8	2	U	17 36.9	2.17	
3.0	306 40 31.6	3 35 3.7	15 53.9	58 15.01	1.648	22.3	3	L	6 2.8	2.15	
3.5	313 33 5.9	4 0 20.6	15 59.3	58 34.77	1.643	22.8	3	U	18 28.4	2.13	
4.0	320 30 43.9	+4 22 23.9	16 4.6	58 54.34	+1.613	23.3	4	L	6 53.9	2.12	
4.5	327 33 25.6	4 40 46.3	16 9.8	59 13.35	1.550	23.8	4	U	19 19.2	2.11	
5.0	334 41 4.0	4 55 2.6	16 14.7	59 31.41	1.455	24.3	5	L	7 44.6	2.12	
5.5	341 53 24.4	5 4 50.1	16 19.3	59 48.11	1.322	24.8	5	U	20 10.1	2.13	
6.0	349 10 2.6	5 9 50.3	16 23.3	60 2.97	1.148	25.3	6	L	8 35.8	2.15	
6.5	356 30 25.5	+5 9 50.1	16 26.7	60 15.50	+0.935	25.8	6	U	21 1.8	2.19	
7.0	3 53 51.2	5 4 42.0	16 29.4	60 25.26	0.687	26.3	7	L	9 28.4	2.24	
7.5	11 19 29.4	4 54 26.0	16 31.2	60 31.85	0.406	26.8	7	U	21 55.5	2.28	
8.0	18 46 23.0	4 39 9.7	16 32.0	60 34.91	+0.100	27.3	8	L	10 23.2	2.34	
8.5	26 13 30.1	4 19 8.3	16 31.8	60 34.18	-0.223	27.8	8	U	22 51.6	2.39	
9.0	33 39 46.7	+3 54 44.8	16 30.6	60 29.55	-0.550	28.3	9	L	11 20.6	2.44	
9.5	41 4 8.9	3 26 28.8	16 28.2	60 21.01	0.873	28.8	9	U	23 50.1	2.48	
10.0	48 25 35.4	2 54 55.7	16 24.9	60 8.68	1.178	29.3			.....	...
10.5	55 43 10.4	2 20 44.6	16 20.6	59 52.84	1.456	0.5	10	L	12 20.1	2.51	
11.0	62 56 5.5	1 44 37.0	16 15.4	59 33.89	1.696	1.0	11	U	0 50.3	2.52	
11.5	70 3 40.6	+1 7 14.9	16 9.5	59 12.30	-1.894	1.5	11	L	13 20.4	2.50	
12.0	77 5 25.3	+0 29 19.3	16 3.1	58 48.62	2.045	2.0	12	U	1 50.3	2.47	
12.5	84 0 59.2	-0 8 31.3	15 56.2	58 23.43	2.145	2.5	12	L	14 19.6	2.42	
13.0	90 50 11.4	0 45 41.7	15 49.1	57 57.33	2.196	3.0	13	U	2 48.3	2.35	
13.5	97 33 0.0	1 21 40.6	15 41.9	57 30.91	2.200	3.5	13	L	15 16.0	2.28	
14.0	104 9 31.7	-1 56 0.6	15 34.7	57 4.69	-2.162	4.0	14	U	3 42.9	2.20	
14.5	110 40 0.1	2 28 19.0	15 27.8	56 39.19	2.083	4.5	14	L	16 8.7	2.11	
15.0	117 4 45.0	2 58 16.7	15 21.2	56 14.84	1.970	5.0	15	U	4 33.5	2.03	
15.5	123 24 11.4	3 25 38.3	15 14.9	55 52.03	1.828	5.5	15	L	16 57.4	1.95	
16.0	129 38 47.7	3 50 11.3	15 9.2	55 31.06	1.663	6.0	16	U	5 20.4	1.89	
16.5	135 49 5.6	-4 11 46.2	15 4.1	55 12.20	-1.480	6.5	16	L	17 42.7	1.83	
17.0	141 55 38.4	-4 30 15.5	14 59.6	54 55.60	-1.283	7.0	17	U	6 4.4	1.78	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
							May	U	h m	m	
May 17.0	141 55 38.4	-4 30 15.5	14 59.6	54 55.60	-1.233	7.0	May 17	U	6 4.4	1.73	
17.5	147 59 0.8	4 45 33.6	14 55.7	54 41.44	1.078	7.5	17	L	18 25.5	1.74	
18.0	153 59 47.9	4 57 36.1	14 52.5	54 29.76	0.868	8.0	18	U	6 46.2	1.73	
18.5	159 58 34.5	5 6 20.2	14 50.0	54 20.63	0.655	8.5	18	L	19 6.7	1.70	
19.0	165 55 55.0	5 11 44.0	14 48.2	54 14.04	0.444	9.0	19	U	7 27.1	1.69	
19.5	171 52 22.6	-5 13 46.4	14 47.1	54 9.96	-0.238	9.5	19	L	19 47.4	1.69	
20.0	177 48 28.8	5 12 27.0	14 46.7	54 8.29	-0.041	10.0	20	U	8 7.8	1.71	
20.5	183 44 43.9	5 7 46.9	14 46.8	54 8.94	+0.143	10.5	20	L	20 28.5	1.74	
21.0	189 41 35.7	4 59 47.7	14 47.6	54 11.78	0.324	11.0	21	U	8 49.5	1.77	
21.5	195 39 30.0	4 48 32.3	14 49.0	54 16.67	0.488	11.5	21	L	21 10.9	1.80	
22.0	201 38 50.1	-4 34 4.9	14 50.8	54 23.44	+0.638	12.0	22	U	9 32.8	1.83	
22.5	207 39 56.8	4 16 31.2	14 53.1	54 31.93	0.773	12.5	22	L	21 55.3	1.91	
23.0	213 43 8.6	3 55 58.8	14 55.8	54 41.93	0.890	13.0	23	U	10 18.6	1.97	
23.5	219 48 41.4	3 32 37.1	14 58.9	54 53.23	0.991	13.5	23	L	22 42.5	2.02	
24.0	225 56 48.9	3 6 37.8	15 2.3	55 5.65	1.076	14.0	24	U	11 7.1	2.03	
24.5	232 7 42.1	-2 38 14.6	15 5.9	55 18.98	+1.143	14.5	24	L	23 32.4	2.14	
25.0	238 21 30.3	2 7 43.9	15 9.8	55 33.02	1.195	15.0	25	U	11 58.4	2.19	
25.5	244 38 20.8	1 35 24.3	15 13.7	55 47.61	1.234	15.5					
26.0	250 58 19.0	1 1 36.8	15 17.8	56 2.57	1.257	16.0	26	L	0 24.9	2.23	
26.5	257 21 29.1	-0 26 44.6	15 21.9	56 17.73	1.268	16.5	26	U	12 51.8	2.25	
27.0	263 47 54.3	+0 8 46.8	15 26.1	56 32.97	+1.270	17.0	27	L	1 19.0	2.27	
27.5	270 17 36.8	0 44 30.6	15 30.2	56 48.17	1.263	17.5	27	U	13 46.3	2.27	
28.0	276 50 37.7	1 19 58.2	15 34.4	57 3.25	1.249	18.0	28	L	2 13.5	2.26	
28.5	283 26 56.1	1 54 40.2	15 38.4	57 18.13	1.231	18.5	28	U	14 40.6	2.25	
29.0	290 6 38.6	2 28 6.8	15 42.4	57 32.78	1.209	19.0	29	L	3 7.4	2.23	
29.5	296 49 39.0	+2 59 47.9	15 46.3	57 47.12	+1.180	19.5	29	U	15 33.8	2.18	
30.0	303 35 58.9	3 29 13.8	15 50.1	58 1.10	1.150	20.0	30	L	3 59.8	2.15	
30.5	310 25 36.7	3 55 56.1	15 53.8	58 14.71	1.116	20.5	30	U	16 25.5	2.12	
31.0	317 18 30.0	4 19 27.4	15 57.4	58 27.87	1.076	21.0	31	L	4 50.8	2.10	
31.5	324 14 34.8	4 39 22.7	16 0.9	58 40.51	1.029	21.5	31	U	17 15.9	2.08	
June 1.0	331 13 45.0	+4 55 19.2	16 4.1	58 52.53	+0.972	22.0	June 1	L	5 40.7	2.07	
1.5	338 15 52.3	5 6 57.3	16 7.2	59 3.78	0.903	22.5	1	U	18 5.6	2.07	
2.0	345 20 45.2	5 14 1.1	16 10.0	59 14.14	0.820	23.0	2	L	6 30.4	2.06	
2.5	352 28 8.8	5 16 18.9	16 12.5	59 23.40	0.719	23.5	2	U	18 55.5	2.10	
3.0	359 37 44.7	5 13 43.7	16 14.7	59 31.33	0.600	24.0	3	L	7 20.8	2.13	
3.5	6 49 10.2	+5 6 13.7	16 16.4	59 37.72	+0.461	24.5	3	U	19 46.6	2.17	
4.0	14 1 58.6	4 53 52.8	16 17.7	59 42.32	0.302	25.0	4	L	8 12.9	2.23	
4.5	21 15 39.7	4 36 50.8	16 18.4	59 44.89	+0.123	25.5	4	U	20 39.9	2.27	
5.0	28 29 39.6	4 15 23.6	16 18.5	59 45.19	-0.075	26.0	5	L	9 7.5	2.33	
5.5	35 43 22.0	3 49 52.5	16 17.9	59 43.04	0.294	26.5	5	U	21 35.8	2.38	
6.0	42 56 8.5	+3 20 44.7	16 16.6	59 38.33	-0.503	27.0	6	L	10 4.7	2.43	
6.5	50 7 20.1	2 48 31.7	16 14.6	59 30.95	0.727	27.5	6	U	22 34.1	2.46	
7.0	57 16 18.2	2 13 48.9	16 11.9	59 20.91	0.945	28.0	7	L	11 3.8	2.48	
7.5	64 22 25.6	1 37 14.2	16 8.4	59 8.30	1.153	28.5	7	U	23 33.6	2.48	
8.0	71 25 8.1	0 59 26.8	16 4.4	58 53.31	1.343	29.0					
8.5	78 23 55.1	+0 21 6.1	15 59.7	58 36.16	-1.510	0.1	8	L	12 3.3	2.47	
9.0	85 18 20.3	-0 17 10.0	15 54.5	58 17.18	-1.648	0.6	9	U	0 32.7	2.43	

GREENWICH MEAN TIME.

L. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	" " "	" " "	" "	" "	"	d			h m	m	
ne 9.0	85 18 20.3	-0 17 10.0	15 54.5	58 17.18	-1.648	0.6	June 9	U	0 32.7	2.42	
9.5	92 8 3.5	0 54 45.5	15 48.9	57 56.73	1.755	1.1	9	L	13 1.4	2.36	
10.0	98 52 49.5	1 31 7.7	15 43.1	57 35.21	1.825	1.6	10	U	1 29.4	2.30	
10.5	105 32 29.3	2 5 47.3	15 37.0	57 13.08	1.857	2.1	10	L	13 56.5	2.22	
11.0	112 7 0.0	2 38 19.2	15 31.0	56 50.79	1.853	2.6	11	U	2 22.6	2.14	
11.5	118 36 24.5	-3 8 22.2	15 25.0	56 28.75	-1.814	3.1	11	L	14 47.8	2.06	
12.0	125 0 50.9	3 35 39.1	15 19.1	56 7.38	1.742	3.6	12	U	3 12.0	1.98	
12.5	131 20 32.8	3 59 56.1	15 13.6	55 47.06	1.640	4.1	12	L	15 35.4	1.92	
13.0	137 35 48.1	4 21 3.1	15 8.4	55 28.14	1.510	4.6	13	U	3 58.0	1.85	
13.5	143 46 59.0	4 38 52.9	15 3.7	55 10.92	1.357	5.1	13	L	16 19.9	1.80	
14.0	149 54 30.9	-4 53 20.2	14 59.6	54 55.65	-1.185	5.6	14	U	4 41.3	1.76	
14.5	155 58 52.0	5 4 22.1	14 56.0	54 42.55	0.906	6.1	14	L	17 2.2	1.73	
15.0	162 0 33.0	5 11 57.3	14 53.1	54 31.80	0.795	6.6	15	U	5 22.8	1.71	
15.5	168 0 6.0	5 16 5.6	14 50.8	54 23.50	0.587	7.1	15	L	17 43.3	1.71	
16.0	173 58 4.6	5 16 48.0	14 49.2	54 17.74	0.372	7.6	16	U	6 3.8	1.71	
16.5	179 55 3.1	-5 14 6.5	14 48.4	54 14.59	-0.154	8.1	16	L	18 24.3	1.72	
17.0	185 51 35.8	5 8 3.5	14 48.2	54 14.03	+0.000	8.6	17	U	6 45.0	1.74	
17.5	191 48 17.0	4 58 42.5	14 48.8	54 16.01	0.270	9.1	17	L	19 6.0	1.77	
18.0	197 45 40.4	4 46 7.8	14 50.0	54 20.49	0.474	9.6	18	U	7 27.4	1.81	
18.5	203 44 18.6	4 30 24.5	14 51.9	54 27.35	0.667	10.1	18	L	19 49.4	1.86	
19.0	209 44 42.9	-4 11 38.8	14 54.3	54 36.44	+0.847	10.6	19	U	8 12.0	1.91	
19.5	215 47 22.6	3 49 58.6	14 57.4	54 47.62	1.012	11.1	19	L	20 35.2	1.97	
20.0	221 52 44.9	3 25 33.0	15 1.0	55 0.67	1.160	11.6	20	U	8 59.2	2.03	
20.5	228 1 14.5	2 58 33.2	15 4.9	55 15.36	1.284	12.1	20	L	21 24.0	2.10	
21.0	234 13 12.8	2 29 12.5	15 9.3	55 31.40	1.387	12.6	21	U	9 49.5	2.16	
21.5	240 28 58.2	-1 57 46.9	15 14.0	55 48.55	+1.467	13.1	21	L	22 15.7	2.21	
22.0	246 48 45.5	1 24 34.8	15 18.9	56 6.50	1.520	13.6	22	U	10 42.5	2.25	
22.5	253 12 45.5	0 49 57.3	15 23.9	56 24.93	1.547	14.1	22	L	23 9.8	2.29	
23.0	259 41 4.6	-0 14 18.5	15 29.0	56 43.52	1.547	14.6	23	U	11 37.4	2.31	
23.5	266 13 45.5	+0 21 54.9	15 34.0	57 1.96	1.522	15.1			.....	...
24.0	272 50 46.4	+0 58 13.7	15 38.9	57 19.95	+1.474	15.6	24	L	0 5.2	2.31	
24.5	279 32 1.2	1 34 6.9	15 43.6	57 37.25	1.404	16.1	24	U	12 32.9	2.31	
25.0	286 17 19.8	2 9 2.0	15 48.1	57 53.57	1.313	16.6	25	L	1 0.5	2.29	
25.5	293 6 28.2	2 42 25.5	15 52.2	58 8.70	1.207	17.1	25	U	13 27.8	2.26	
26.0	299 59 9.6	3 13 44.4	15 56.0	58 22.49	1.090	17.6	26	L	1 54.7	2.23	
26.5	306 55 4.2	+3 42 26.5	15 59.3	58 34.83	+0.965	18.1	26	U	14 21.2	2.19	
27.0	313 53 49.5	4 8 1.3	16 2.3	58 45.64	0.835	18.6	27	L	2 47.2	2.15	
27.5	320 55 2.0	4 30 1.3	16 4.8	58 54.87	0.705	19.1	27	U	15 12.9	2.12	
28.0	327 58 17.2	4 48 2.2	16 6.9	59 2.55	0.575	19.6	28	L	3 38.2	2.10	
28.5	335 3 10.2	5 1 44.0	16 8.5	59 8.68	0.449	20.1	28	U	16 3.3	2.08	
29.0	342 9 16.5	+5 10 51.3	16 9.8	59 13.35	+0.330	20.6	29	L	4 28.2	2.07	
29.5	349 16 12.1	5 15 13.6	16 10.7	59 16.60	0.212	21.1	29	U	16 53.1	2.08	
30.0	356 23 34.4	5 14 45.6	16 11.2	59 18.46	+0.101	21.6	30	L	5 18.2	2.09	
30.5	3 31 2.0	5 9 27.4	16 11.4	59 19.04	-0.005	22.1	30	U	17 43.4	2.11	
ly 1.0	10 38 14.8	4 59 24.1	16 11.2	59 18.35	0.110	22.6	July 1	L	6 9.0	2.15	
1.5	17 44 53.8	+4 44 46.2	16 10.6	59 16.41	-0.213	23.1	1	U	18 35.0	2.19	
2.0	24 50 41.5	+4 25 48.4	16 9.8	59 13.23	-0.318	23.6	2	L	7 1.6	2.24	

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				V H
		" ' "	" ' "	" "	" "	"	d			h m		
July	1.0	10 38 14.8	+4 59 24.1	16 11.2	59 18.35	-0.110	22.6	July	1	L	6 9.0	1
	1.5	17 44 53.8	4 44 46.2	16 10.6	59 16.41	0.213	23.1		1	U	18 35.0	2
	2.0	24 50 41.5	4 25 48.4	16 9.8	59 13.23	0.318	23.6		2	L	7 1.6	2
	2.5	31 55 21.6	4 2 50.3	16 8.6	59 8.79	0.422	24.1		2	U	19 28.7	2
	3.0	38 58 38.0	3 36 15.4	16 7.0	59 3.10	0.530	24.6		3	L	7 56.4	2
	3.5	46 0 15.5	+3 6 30.8	16 5.1	58 56.07	-0.641	25.1		3	U	20 24.7	2
	4.0	52 59 59.0	2 34 6.3	16 2.8	58 47.72	0.752	25.6		4	L	8 53.4	2
	4.5	59 57 33.5	1 59 34.5	16 0.2	58 38.02	0.865	26.1		4	U	21 22.3	2
	5.0	66 52 44.2	1 23 29.3	15 57.2	58 26.95	0.977	26.6		5	L	9 51.5	2
	5.5	73 45 16.6	0 46 25.6	15 53.8	58 14.56	1.085	27.1		5	U	22 20.5	2
	6.0	80 34 56.4	+0 8 58.2	15 50.1	58 0.89	-1.186	27.6		6	L	10 49.2	2
	6.5	87 21 29.6	-0 28 18.5	15 46.0	57 46.05	1.279	28.1		6	U	23 17.5	2
	7.0	94 4 43.6	1 4 51.9	15 41.7	57 30.15	1.358	28.6		7	L	11 45.1	2
	7.5	100 44 26.8	1 40 11.1	15 37.1	57 13.39	1.420	29.1					
	8.0	107 20 29.7	2 13 48.3	15 32.3	56 56.01	1.462	0.2		8	U	0 11.9	2
	8.5	113 52 44.8	-2 45 18.4	15 27.5	56 38.22	-1.484	0.7		8	L	12 37.8	2
	9.0	120 21 7.3	3 14 19.9	15 22.7	56 20.30	1.483	1.2		9	U	1 2.9	2
	9.5	126 45 35.5	3 40 34.8	15 17.8	56 2.53	1.458	1.7		9	L	13 27.2	1
	10.0	133 6 11.1	4 3 48.6	15 13.1	55 45.21	1.409	2.2		10	U	1 50.6	1
	10.5	139 22 59.3	4 23 50.0	15 8.6	55 28.62	1.335	2.7		10	L	14 13.3	1
	11.0	145 36 9.0	-4 40 31.0	15 4.3	55 13.06	-1.238	3.2		11	U	2 35.3	1
	11.5	151 45 52.6	4 53 46.2	15 0.4	54 58.81	1.119	3.7		11	L	14 56.8	1
	12.0	157 52 26.4	5 3 32.8	14 57.0	54 46.12	0.980	4.2		12	U	3 17.9	1
	12.5	163 56 10.3	5 9 50.2	14 54.0	54 35.22	0.822	4.7		12	L	15 38.7	1
	13.0	169 57 26.9	5 12 39.2	14 51.6	54 26.33	0.648	5.2		13	U	3 59.3	1
	13.5	175 56 42.4	-5 12 2.1	14 49.8	54 19.62	-0.460	5.7		13	L	16 19.9	1
	14.0	181 54 25.2	5 8 2.5	14 48.6	54 15.23	0.262	6.2		14	U	4 40.4	1
	14.5	187 51 6.5	5 0 44.8	14 48.0	54 13.30	-0.055	6.7		14	L	17 1.2	1
	15.0	193 47 19.2	4 50 14.3	14 48.2	54 13.90	+0.156	7.2		15	U	5 22.2	1
	15.5	199 43 37.6	4 36 37.0	14 49.1	54 17.06	0.372	7.7		15	L	17 43.6	1
	16.0	205 40 37.5	-4 19 59.4	14 50.6	54 22.83	+0.588	8.2		16	U	6 5.5	1
	16.5	211 38 55.0	4 0 29.1	14 52.9	54 31.15	0.799	8.7		16	L	18 28.0	1
	17.0	217 39 6.2	3 38 14.5	14 55.9	54 41.97	1.003	9.2		17	U	6 51.1	1
	17.5	223 41 47.6	3 13 25.3	14 59.4	54 55.18	1.196	9.7		17	L	19 14.9	2
	18.0	229 47 34.0	2 46 12.4	15 3.7	55 10.62	1.375	10.2		18	U	7 39.5	2
	18.5	235 56 58.9	-2 16 48.6	15 8.4	55 28.10	+1.534	10.7		18	L	20 4.8	2
	19.0	242 10 33.5	1 45 28.6	15 13.7	55 47.35	1.671	11.2		19	U	8 30.9	2
	19.5	248 28 45.8	1 12 29.7	15 19.3	56 8.10	1.782	11.7		19	L	20 57.6	2
	20.0	254 52 0.1	0 38 11.6	15 25.3	56 29.99	1.863	12.2		20	U	9 24.8	2
	20.5	261 20 35.8	-0 2 57.1	15 31.5	56 52.67	1.911	12.7		20	L	21 52.4	2
	21.0	267 54 46.7	+0 32 48.1	15 37.8	57 15.71	+1.921	13.2		21	U	10 20.3	2
	21.5	274 34 40.2	1 8 35.4	15 44.0	57 38.62	1.893	13.7		21	L	22 48.3	2
	22.0	281 20 16.7	1 43 53.4	15 50.1	58 0.98	1.827	14.2		22	U	11 16.2	2
	22.5	288 11 28.8	2 18 8.5	15 55.9	58 22.32	1.724	14.7		22	L	23 43.9	2
	23.0	295 8 1.0	2 50 45.6	16 1.3	58 42.20	1.583	15.2					
	23.5	302 9 30.3	+3 21 8.9	16 6.2	59 0.18	+1.410	15.7		23	U	12 11.3	2
	24.0	309 15 25.9	+3 48 43.5	16 10.5	59 15.93	+1.211	16.2		24	L	0 38.4	2

GREENWICH MEAN TIME.

h. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
									h m	m	
y	24.0	309 15 25.9	+3 48 43.5	16 10.5	59 15.93	+1.211	16.2	July 24	L	0 38.4	2.24
	24.5	316 25 10.1	4 12 56.4	16 14.1	59 29.15	0.989	16.7	24	U	13 5.1	2.21
	25.0	323 38 0.0	4 33 17.4	16 17.0	59 39.61	0.754	17.2	25	L	1 31.4	2.18
	25.5	330 53 8.5	4 49 21.0	16 19.0	59 47.23	0.515	17.7	25	U	13 57.4	2.16
	26.0	338 9 46.5	5 0 47.3	16 20.3	59 51.98	0.277	18.2	26	L	2 23.2	2.14
	26.5	345 27 4.5	+5 7 22.4	16 20.9	59 53.90	+0.046	18.7	26	U	14 48.9	2.13
	27.0	352 44 14.5	5 8 59.0	16 20.7	59 53.14	-0.170	19.2	27	L	3 14.4	2.13
	27.5	0 0 32.2	5 5 36.6	16 19.8	59 49.89	0.368	19.7	27	U	15 40.1	2.14
	28.0	7 15 18.0	4 57 21.6	16 18.3	59 44.40	0.543	20.2	28	L	4 5.9	2.16
	28.5	14 27 57.9	4 44 26.0	16 16.2	59 36.95	0.695	20.7	28	U	16 32.0	2.19
	29.0	21 38 4.2	+4 27 6.8	16 13.8	59 27.82	-0.824	21.2	29	L	4 58.5	2.22
	29.5	28 45 15.6	4 5 46.0	16 10.9	59 17.27	0.930	21.7	29	U	17 25.3	2.25
	30.0	35 49 17.2	3 40 48.9	16 7.7	59 5.58	1.014	22.2	30	L	5 52.6	2.29
	30.5	42 49 59.4	3 12 43.4	16 4.3	58 53.00	1.081	22.7	30	U	18 20.3	2.33
	31.0	49 47 17.4	2 41 59.4	16 0.6	58 39.69	1.134	23.2	31	L	6 48.4	2.36
	31.5	56 41 10.2	+2 9 8.4	15 56.8	58 25.83	-1.173	23.7	31	U	19 16.8	2.37
ug.	1.0	63 31 39.7	1 34 42.2	15 53.0	58 11.57	1.203	24.2	Aug. 1	L	7 45.3	2.38
	1.5	70 18 49.5	0 59 12.8	15 49.0	57 57.00	1.225	24.7	1	U	20 13.9	2.37
	2.0	77 2 44.4	+0 23 11.8	15 45.0	57 42.19	1.243	25.2	2	L	8 42.2	2.35
	2.5	83 43 29.3	-0 12 49.8	15 40.9	57 27.20	1.254	25.7	2	U	21 10.2	2.31
	3.0	90 21 9.0	-0 48 22.3	15 36.8	57 12.11	-1.261	26.2	3	L	9 37.7	2.27
	3.5	96 55 47.4	1 22 57.6	15 32.6	56 56.95	1.265	26.7	3	U	22 4.6	2.21
	4.0	103 27 27.5	1 56 9.0	15 28.5	56 41.76	1.265	27.2	4	L	10 30.7	2.15
	4.5	109 56 11.5	2 27 32.4	15 24.4	56 26.60	1.261	27.7	4	U	22 56.1	2.09
	5.0	116 22 0.7	2 56 46.0	15 20.3	56 11.53	1.250	28.2	5	L	11 20.8	2.02
	5.5	122 44 55.7	-3 23 30.4	15 16.2	55 56.65	-1.229	28.7	5	U	23 44.6	1.96
	6.0	129 4 57.3	3 47 29.1	15 12.2	55 42.08	1.199	29.2			.....	...
	6.5	135 22 6.3	4 8 28.5	15 8.4	55 27.92	1.158	0.1	6	L	12 7.8	1.90
	7.0	141 36 24.3	4 26 17.8	15 4.7	55 14.34	1.103	0.6	7	U	0 30.3	1.85
	7.5	147 47 54.5	4 40 49.0	15 1.2	55 1.49	1.036	1.1	7	L	12 52.2	1.81
	8.0	153 56 41.5	-4 51 56.8	14 57.9	54 49.53	-0.954	1.6	8	U	1 13.7	1.77
	8.5	160 2 52.2	4 59 38.3	14 55.0	54 38.67	0.854	2.1	8	L	13 34.7	1.74
	9.0	166 6 36.1	5 3 53.0	14 52.3	54 29.10	0.740	2.6	9	U	1 55.6	1.73
	9.5	172 8 5.7	5 4 42.4	14 50.1	54 20.97	0.612	3.1	9	L	14 16.2	1.72
	10.0	178 7 36.3	5 2 9.6	14 48.4	54 14.47	0.468	3.6	10	U	2 36.8	1.72
	10.5	184 5 26.5	-4 56 19.3	14 47.1	54 9.80	-0.309	4.1	10	L	14 57.5	1.73
	11.0	190 1 58.1	4 47 17.5	14 46.4	54 7.11	-0.138	4.6	11	U	3 18.3	1.74
	11.5	195 57 35.8	4 35 11.0	14 46.2	54 6.55	+0.046	5.1	11	L	15 39.4	1.77
	12.0	201 52 47.6	4 20 7.6	14 46.7	54 8.26	0.240	5.6	12	U	4 0.8	1.80
	12.5	207 48 4.3	4 2 15.8	14 47.8	54 12.35	0.442	6.1	12	L	16 22.6	1.84
	13.0	213 43 58.7	-3 41 45.1	14 49.6	54 18.89	+0.650	6.6	13	U	4 44.9	1.89
	13.5	219 41 6.2	3 18 45.4	14 52.0	54 27.95	0.861	7.1	13	L	17 7.9	1.94
	14.0	225 40 3.9	2 53 27.4	14 55.2	54 39.54	1.070	7.6	14	U	5 31.4	1.99
	14.5	231 41 30.2	2 26 3.3	14 59.0	54 53.61	1.275	8.1	14	L	17 55.7	2.05
	15.0	237 46 4.1	1 56 45.8	15 3.5	55 10.13	1.476	8.6	15	U	6 20.6	2.10
	15.5	243 54 24.5	-1 25 49.7	15 8.7	55 28.99	+1.664	9.1	15	L	18 46.2	2.15
	16.0	250 7 9.6	-0 53 31.2	15 14.4	55 49.99	+1.833	9.6	16	U	7 12.3	2.21

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.		
	" ' "	" ' "	" "	" "	" "	d		h m	
Aug. 16.0	250 7 9.6	-0 53 31.2	15 14.4	55 49.99	+1.833	9.6	Aug. 16	U	7 12.3
16.5	256 24 56.1	-0 20 8.7	15 20.6	56 12.91	1.983	10.1	16	L	19 39.1
17.0	262 48 17.7	+0 13 57.0	15 27.3	56 37.46	2.104	10.6	17	U	8 6.2
17.5	269 17 43.8	0 48 22.5	15 34.4	57 3.27	2.193	11.1	17	L	20 33.6
18.0	275 53 39.0	1 22 41.5	15 41.6	57 29.93	2.243	11.6	18	U	9 1.3
18.5	282 36 20.6	+1 56 24.8	15 49.0	57 56.94	+2.250	12.1	18	L	21 28.9
19.0	289 25 57.9	2 29 0.6	15 56.3	58 23.75	2.210	12.6	19	U	9 56.6
19.5	296 22 30.5	2 59 55.1	16 3.4	58 49.77	2.119	13.1	19	L	22 24.0
20.0	303 25 47.1	3 28 32.8	16 10.1	59 14.40	1.977	13.6	20	U	10 51.3
20.5	310 35 25.1	3 54 18.0	16 16.3	59 37.02	1.784	14.1	20	L	23 18.3
21.0	317 50 49.7	+4 16 36.1	16 21.7	59 57.04	+1.545	14.6	21	U	11 45.2
21.5	325 11 15.1	4 34 54.9	16 26.3	60 13.95	1.266	15.1			.....
22.0	332 35 45.3	4 48 46.5	16 30.0	60 27.29	0.953	15.6	22	L	0 11.8
22.5	340 3 16.1	4 57 48.9	16 32.5	60 36.75	0.621	16.1	22	U	12 38.3
23.0	347 32 37.8	5 1 47.1	16 34.0	60 42.16	+0.280	16.6	23	L	1 4.8
23.5	355 2 38.3	+5 0 34.1	16 34.4	60 43.46	-0.061	17.1	23	U	13 31.3
24.0	2 32 5.9	4 54 11.4	16 33.6	60 40.74	0.388	17.6	24	L	1 57.9
24.5	9 59 53.5	4 42 48.7	16 31.8	60 34.24	0.690	18.1	24	U	14 24.7
25.0	17 25 0.2	4 26 43.0	16 29.1	60 24.31	0.959	18.6	25	L	2 51.8
25.5	24 46 34.5	4 6 17.8	16 25.6	60 11.38	1.190	19.1	25	U	15 19.2
26.0	32 3 54.7	+3 42 1.7	16 21.4	59 55.90	-1.383	19.6	26	L	3 47.0
26.5	39 16 30.0	3 14 26.7	16 16.6	59 38.37	1.531	20.1	26	U	16 15.1
27.0	46 24 0.1	2 44 7.0	16 11.4	59 19.32	1.637	20.6	27	L	4 43.6
27.5	53 26 14.7	2 11 37.8	16 6.0	58 59.23	1.706	21.1	27	U	17 12.2
28.0	60 23 11.7	1 37 34.0	16 0.3	58 38.50	1.743	21.6	28	L	5 40.9
28.5	67 14 56.6	+1 2 29.8	15 54.6	58 17.53	-1.748	22.1	28	U	18 9.6
29.0	74 1 39.9	+0 26 57.8	15 48.9	57 56.65	1.729	22.6	29	L	6 38.0
29.5	80 43 36.8	-0 8 31.4	15 43.3	57 36.12	1.690	23.1	29	U	19 6.1
30.0	87 21 4.4	0 43 28.9	15 37.9	57 16.15	1.637	23.6	30	L	7 33.7
30.5	93 54 21.8	1 17 28.4	15 32.6	56 56.88	1.573	24.1	30	U	20 0.7
31.0	100 23 48.0	-1 50 5.6	15 27.6	56 38.42	-1.503	24.6	31	L	8 27.0
31.5	106 49 41.7	2 20 58.3	15 22.8	56 20.84	1.426	25.1	31	U	20 52.5
Sept. 1.0	113 12 20.2	2 49 46.9	15 18.3	56 4.20	1.348	25.6	Sept. 1	L	9 17.3
1.5	119 31 59.2	3 16 13.7	15 14.0	55 48.50	1.269	26.1	1	U	21 41.3
2.0	125 48 52.6	3 40 3.1	15 10.0	55 33.75	1.190	26.6	2	L	10 4.6
2.5	132 3 12.2	-4 1 2.0	15 6.2	55 19.93	-1.111	27.1	2	U	22 27.3
3.0	138 15 8.3	4 18 59.5	15 2.7	55 7.09	1.030	27.6	3	L	10 49.4
3.5	144 24 49.3	4 33 46.8	14 59.5	54 55.20	0.952	28.1	3	U	23 11.1
4.0	150 32 22.5	4 45 17.4	14 56.5	54 44.26	0.870	28.6	4	L	11 32.3
4.5	156 37 54.7	4 53 27.3	14 53.8	54 34.34	0.783	29.1	4	U	23 53.3
5.0	162 41 32.0	-4 58 14.3	14 51.4	54 25.47	-0.694	0.1			.....
5.5	168 43 21.2	4 59 38.5	14 49.2	54 17.70	0.600	0.6	5	L	12 14.0
6.0	174 43 29.9	4 57 41.9	14 47.4	54 11.10	0.497	1.1	6	U	0 34.7
6.5	180 42 6.9	4 52 28.2	14 46.0	54 5.80	0.385	1.6	6	L	12 55.3
7.0	186 39 22.8	4 44 3.1	14 44.9	54 1.88	0.266	2.1	7	U	1 16.0
7.5	192 35 30.6	-4 32 33.5	14 44.3	53 59.45	-0.136	2.6	7	L	13 36.9
8.0	198 30 45.4	-4 18 7.8	14 44.1	53 58.65	+0.004	3.1	8	U	1 58.1

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	" ' "	" ' "	" "	" "	"	d			h m	m	
ept. 8.0	198 30 45.4	-4 18 7.8	14 44.1	53 58.65	+0.004	3.1	Sept. 8	U	1 58.1	1.78	
8.5	204 25 25.7	4 0 55.3	14 44.3	53 59.59	0.154	3.6	8	L	14 19.6	1.81	
9.0	210 19 52.6	3 41 6.5	14 45.1	54 2.39	0.315	4.1	9	U	2 41.5	1.84	
9.5	216 14 30.2	3 18 52.7	14 46.4	54 7.20	0.487	4.6	9	L	15 3.8	1.88	
10.0	222 9 45.6	2 54 25.9	14 48.3	54 14.11	0.667	5.1	10	U	3 26.7	1.93	
10.5	228 6 9.1	-2 27 59.0	14 50.8	54 23.23	+0.854	5.6	10	L	15 50.1	1.98	
11.0	234 4 13.4	1 59 45.8	14 53.9	54 34.63	1.046	6.1	11	U	4 14.2	2.03	
11.5	240 4 33.8	1 30 0.7	14 57.6	54 48.34	1.240	6.6	11	L	16 38.7	2.07	
12.0	246 7 47.5	0 58 59.4	15 2.0	55 4.40	1.435	7.1	12	U	5 3.8	2.11	
12.5	252 14 33.1	-0 26 58.6	15 7.0	55 22.80	1.629	7.6	12	L	17 29.4	2.16	
13.0	258 25 30.2	+0 5 43.7	15 12.6	55 43.46	+1.813	8.1	13	U	5 55.5	2.19	
13.5	264 41 18.2	0 38 47.4	15 18.8	56 6.25	1.982	8.6	13	L	18 21.9	2.21	
14.0	271 2 35.2	1 11 50.7	15 25.6	56 30.96	2.134	9.1	14	U	6 48.5	2.23	
14.5	277 29 57.4	1 44 29.9	15 32.8	56 57.37	2.263	9.6	14	L	19 15.3	2.24	
15.0	284 3 56.9	2 16 18.6	15 40.3	57 25.15	2.360	10.1	15	U	7 42.2	2.24	
15.5	290 45 0.8	+2 46 48.5	15 48.1	57 53.85	+2.417	10.6	15	L	20 9.0	2.24	
16.0	297 33 28.8	3 15 29.0	15 56.1	58 22.98	2.430	11.1	16	U	8 35.9	2.23	
16.5	304 29 31.4	3 41 47.8	16 4.0	58 51.98	2.393	11.6	16	L	21 2.6	2.23	
17.0	311 33 8.6	4 5 11.8	16 11.7	59 20.20	2.300	12.1	17	U	9 29.3	2.22	
17.5	318 44 7.7	4 25 7.7	16 19.0	59 46.94	2.147	12.6	17	L	21 55.9	2.22	
18.0	326 2 2.4	+4 41 4.0	16 25.6	60 11.48	+1.933	13.1	18	U	10 22.5	2.22	
18.5	333 26 12.4	4 52 31.9	16 31.5	60 33.11	1.663	13.6	18	L	22 49.2	2.23	
19.0	340 55 43.5	4 59 7.7	16 36.5	60 51.17	1.340	14.1	19	U	11 16.0	2.24	
19.5	348 29 29.2	5 0 34.3	16 40.3	61 5.09	0.974	14.6	19	L	23 43.0	2.26	
20.0	356 6 13.0	4 56 42.3	16 42.8	61 14.43	0.578	15.1			.....	...
20.5	3 44 31.8	+4 47 31.6	16 44.0	61 18.90	+0.166	15.6	20	U	12 10.2	2.29	
21.0	11 22 59.6	4 33 11.6	16 43.9	61 18.41	-0.247	16.1	21	L	0 37.9	2.32	
21.5	19 0 11.7	4 14 0.8	16 42.4	61 13.02	0.648	16.6	21	U	13 5.9	2.35	
22.0	26 34 48.5	3 50 25.7	16 39.7	61 2.99	1.018	17.1	22	L	1 34.4	2.39	
22.5	34 5 39.4	3 22 59.7	16 35.8	60 48.76	1.347	17.6	22	U	14 3.3	2.42	
23.0	41 31 44.7	+2 52 20.8	16 30.9	60 30.86	-1.627	18.1	23	L	2 32.5	2.45	
23.5	48 52 17.4	2 19 9.6	16 25.2	60 9.92	1.854	18.6	23	U	15 2.1	2.47	
24.0	56 6 43.8	1 44 7.7	16 18.9	59 46.59	2.025	19.1	24	L	3 31.8	2.47	
24.5	63 14 43.2	1 7 56.1	16 12.0	59 21.55	2.140	19.6	24	U	16 1.4	2.46	
25.0	70 16 6.7	+0 31 13.3	16 4.9	58 55.45	2.203	20.1	25	L	4 30.9	2.44	
25.5	77 10 55.5	-0 5 24.6	15 57.7	58 28.88	-2.217	20.6	25	U	17 0.0	2.40	
26.0	83 59 20.0	0 41 25.0	15 50.5	58 2.40	2.192	21.1	26	L	5 28.5	2.35	
26.5	90 41 36.8	1 16 19.0	15 43.4	57 36.41	2.134	21.6	26	U	17 56.3	2.28	
27.0	97 18 7.5	1 49 41.1	15 36.6	57 11.30	2.047	22.1	27	L	6 23.3	2.21	
27.5	103 49 17.1	2 21 9.4	15 30.0	56 47.36	1.940	22.6	27	U	18 49.4	2.14	
28.0	110 15 32.7	-2 50 24.8	15 23.9	56 24.81	-1.817	23.1	28	L	7 14.7	2.07	
28.5	116 37 22.1	3 17 11.3	15 18.1	56 3.80	1.684	23.6	28	U	19 39.2	2.01	
29.0	122 55 12.4	3 41 15.2	15 12.9	55 44.43	1.544	24.1	29	L	8 2.9	1.94	
29.5	129 9 30.4	4 2 25.3	15 8.1	55 26.76	1.403	24.6	29	U	20 25.8	1.88	
30.0	135 20 41.1	4 20 32.2	15 3.7	55 10.77	1.261	25.1	30	L	8 48.1	1.84	
30.5	141 29 7.3	-4 35 28.7	14 59.8	54 56.48	-1.122	25.6	30	U	21 9.9	1.80	
ct. 1.0	147 35 9.8	-4 47 9.3	14 56.4	54 43.82	-0.988	26.1	Oct. 1	L	9 31.3	1.77	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
									h m	m	
Oct. 1.0	147 35 9.8	-4 47 9.3	14 56.4	54 43.82	-0.988	26.1	Oct. 1	L	9 31.3	1.77	
1.5	153 39 7.5	4 55 30.2	14 53.4	54 32.75	0.857	26.6	1	U	21 52.3	1.74	
2.0	159 41 16.7	5 0 29.2	14 50.8	54 23.23	0.733	27.1	2	L	10 13.0	1.72	
2.5	165 41 51.9	5 2 6.2	14 48.5	54 15.14	0.615	27.6	2	U	22 33.6	1.72	
3.0	171 41 6.0	5 0 22.3	14 46.7	54 8.47	0.497	28.1	3	L	10 54.2	1.72	
3.5	177 39 10.5	-4 55 20.5	14 45.3	54 3.19	-0.385	28.6	3	U	23 14.9	1.73	
4.0	183 36 16.1	4 47 5.5	14 44.2	53 59.21	0.277	29.1	4	L	11 35.7	1.74	
4.5	189 32 33.1	4 35 43.6	14 43.5	53 56.55	0.168	29.6	4	U	23 56.7	1.76	
5.0	196 28 11.7	4 21 22.5	14 43.1	53 55.19	-0.059	0.4			.....	....
5.5	201 23 23.2	4 4 11.6	14 43.1	53 55.15	+0.053	0.9	5	L	12 18.0	1.79	
6.0	207 18 19.4	-3 44 21.4	14 43.5	53 56.48	+0.167	1.4	6	U	0 39.7	1.82	
6.5	213 13 13.7	3 22 3.7	14 44.2	53 59.19	0.286	1.9	6	L	13 1.8	1.86	
7.0	219 8 21.4	2 57 31.9	14 45.3	54 3.38	0.412	2.4	7	U	1 24.3	1.90	
7.5	225 3 59.8	2 31 0.0	14 46.9	54 9.11	0.543	2.9	7	L	13 47.4	1.95	
8.0	231 0 28.8	2 2 43.0	14 48.9	54 16.44	0.681	3.4	8	U	2 11.0	1.98	
8.5	236 58 10.5	-1 32 56.9	14 51.4	54 25.48	+0.828	3.9	8	L	14 35.0	2.02	
9.0	242 57 29.8	1 1 58.5	14 54.3	54 36.32	0.979	4.4	9	U	2 59.6	2.06	
9.5	248 58 54.2	-0 30 5.4	14 57.8	54 48.99	1.136	4.9	9	L	15 24.5	2.09	
10.0	255 2 53.5	+0 2 23.9	15 1.7	55 3.60	1.300	5.4	10	U	3 49.8	2.12	
10.5	261 9 59.8	0 35 9.9	15 6.3	55 20.18	1.464	5.9	10	L	16 15.4	2.14	
11.0	267 20 46.6	+1 7 52.2	15 11.3	55 38.72	+1.626	6.4	11	U	4 41.2	2.16	
11.5	273 35 48.3	1 40 9.2	15 16.9	55 59.18	1.785	6.9	11	L	17 7.2	2.16	
12.0	279 55 40.2	2 11 38.2	15 23.0	56 21.52	1.935	7.4	12	U	5 33.1	2.16	
12.5	286 20 56.6	2 41 54.8	15 29.5	56 45.59	2.073	7.9	12	L	17 59.1	2.16	
13.0	292 52 9.9	3 10 33.5	15 36.5	57 11.19	2.190	8.4	13	U	6 25.0	2.15	
13.5	299 29 49.1	+3 37 7.4	15 43.8	57 38.05	+2.282	8.9	13	L	18 50.8	2.15	
14.0	306 14 19.1	4 1 8.3	15 51.4	58 5.82	2.340	9.4	14	U	7 16.5	2.15	
14.5	313 5 57.7	4 22 7.7	15 59.1	58 34.06	2.360	9.9	14	L	19 42.3	2.15	
15.0	320 4 54.4	4 39 36.8	16 6.8	59 2.26	2.332	10.4	15	U	8 8.0	2.15	
15.5	327 11 8.8	4 53 7.4	16 14.3	59 29.81	2.250	10.9	15	L	20 33.8	2.16	
16.0	334 24 28.6	+5 2 13.7	16 21.4	59 56.02	+2.108	11.4	16	U	8 59.8	2.18	
16.5	341 44 28.3	5 6 33.2	16 28.0	60 20.20	1.911	11.9	16	L	21 26.1	2.20	
17.0	349 10 29.0	5 5 48.2	16 33.9	60 41.64	1.633	12.4	17	U	9 52.7	2.23	
17.5	356 41 38.5	4 59 48.0	16 38.8	60 59.63	1.335	12.9	17	L	22 19.7	2.27	
18.0	4 16 52.2	4 48 29.5	16 42.6	61 13.50	0.970	13.4	18	U	10 47.3	2.32	
18.5	11 54 55.3	+4 31 58.7	16 45.1	61 22.78	+0.571	13.9	18	L	23 15.5	2.38	
19.0	19 34 26.4	4 10 31.3	16 46.3	61 27.11	+0.146	14.4	19	U	11 44.4	2.43	
19.5	27 14 0.4	3 44 32.0	16 46.0	61 26.25	-0.288	14.9			.....	....
20.0	34 52 12.5	3 14 33.8	16 44.4	61 20.24	0.711	15.4	20	L	0 13.8	2.48	
20.5	42 27 42.4	2 41 16.3	16 41.4	61 9.28	1.110	15.9	20	U	12 43.9	2.52	
21.0	49 59 17.8	+2 5 23.7	16 37.2	60 53.75	-1.471	16.4	21	L	1 14.3	2.55	
21.5	57 25 55.9	1 27 42.8	16 31.8	60 34.17	1.782	16.9	21	U	13 45.0	2.57	
22.0	64 46 46.7	0 49 0.3	16 25.6	60 11.21	2.034	17.4	22	L	2 15.8	2.56	
22.5	72 1 12.9	+0 10 1.0	16 18.6	59 45.59	2.226	17.9	22	U	14 46.3	2.53	
23.0	79 5 49.6	-0 26 33.5	16 11.1	59 18.02	2.388	18.4	23	L	3 16.4	2.48	
23.5	86 9 24.4	-1 6 5.7	16 3.2	58 49.24	-2.628	18.9	23	U	15 45.8	2.42	
24.0	93 2 56.1	-1 42 8.3	15 55.3	58 19.97	-2.442	19.4	24	L	4 14.4	2.35	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	" ' "	" ' "	" "	" "	" "	d			h m	m	
et. 24.0	93 2 56.1	-1 42 3.3	15 55.3	58 19.97	-2.442	19.4	Oct. 24	L	4 14.4	2.35	
24.5	99 49 32.3	2 15 58.8	15 47.3	57 50.82	2.409	19.9	24	U	16 42.1	2.26	
25.0	106 29 28.6	2 47 29.6	15 39.6	57 22.31	2.335	20.4	25	L	5 8.7	2.18	
25.5	113 3 6.8	3 16 17.5	15 32.1	56 54.91	2.236	20.9	25	U	17 34.4	2.10	
26.0	119 30 52.7	3 42 8.1	15 25.0	56 28.99	2.090	21.4	26	L	5 59.1	2.02	
26.5	125 53 15.6	-4 4 50.8	15 18.4	56 4.82	-1.935	21.9	26	U	18 22.9	1.95	
27.0	132 10 46.2	4 24 17.5	15 12.4	55 42.62	1.765	22.4	27	L	6 45.9	1.88	
27.5	138 23 56.6	4 40 22.5	15 6.9	55 22.51	1.585	22.9	27	U	19 8.1	1.83	
28.0	144 33 18.7	4 53 2.4	15 2.0	55 4.60	1.400	23.4	28	L	7 29.9	1.79	
28.5	150 39 23.5	5 2 15.0	14 57.7	54 48.91	1.214	23.9	28	U	19 51.1	1.75	
29.0	156 42 41.0	-5 8 0.0	14 54.1	54 35.45	-1.032	24.4	29	L	8 12.0	1.73	
29.5	162 43 39.6	5 10 18.3	14 51.0	54 24.13	0.855	24.9	29	U	20 32.7	1.72	
30.0	168 42 45.7	5 9 12.0	14 48.5	54 14.91	0.683	25.4	30	L	8 53.3	1.71	
30.5	174 40 23.6	5 4 44.2	14 46.5	54 7.70	0.520	25.9	30	U	21 13.8	1.72	
31.0	180 36 55.8	4 56 59.5	14 45.1	54 2.40	0.365	26.4	31	L	9 34.5	1.73	
31.5	186 32 42.6	-4 46 3.6	14 44.1	53 58.91	-0.220	26.9	31	U	21 55.3	1.74	
IV. 1.0	192 28 2.2	4 32 3.4	14 43.6	53 57.08	-0.086	27.4	Nov. 1	L	10 16.4	1.77	
1.5	198 23 11.3	4 15 7.5	14 43.5	53 56.81	+0.040	27.9	1	U	22 37.9	1.81	
2.0	204 18 25.2	3 55 25.6	14 43.9	53 58.01	0.158	28.4	2	L	10 59.8	1.85	
2.5	210 13 57.7	3 33 8.8	14 44.6	54 0.58	0.269	28.9	2	U	23 22.2	1.88	
3.0	216 10 2.5	-3 8 29.8	14 45.6	54 4.44	+0.373	29.4	3	L	11 45.0	1.92	
3.5	222 6 52.0	2 41 42.8	14 47.0	54 9.52	0.473	0.1			.....	...
4.0	228 4 39.1	2 13 3.2	14 48.7	54 15.79	0.571	0.6	4	U	0 8.4	1.97	
4.5	234 3 37.0	1 42 47.9	14 50.7	54 23.22	0.666	1.1	4	L	12 32.3	2.01	
5.0	240 3 59.0	1 11 14.8	14 53.1	54 31.77	0.760	1.6	5	U	0 56.7	2.05	
5.5	246 6 0.2	-0 38 42.9	14 55.7	54 41.48	+0.857	2.1	5	L	13 21.5	2.08	
6.0	252 9 56.2	-0 5 32.3	14 58.7	54 52.35	0.956	2.6	6	U	1 46.7	2.11	
6.5	258 16 4.3	+0 27 55.9	15 2.0	55 4.43	1.058	3.1	6	L	14 12.1	2.13	
7.0	264 24 43.2	1 1 20.1	15 5.6	55 17.76	1.163	3.6	7	U	2 37.8	2.14	
7.5	270 36 13.2	1 34 17.8	15 9.6	55 32.35	1.270	4.1	7	L	15 3.4	2.14	
8.0	276 50 55.9	+2 6 26.2	15 13.9	55 48.24	+1.379	4.6	8	U	3 29.1	2.14	
8.5	283 9 14.4	2 37 21.7	15 18.6	56 5.45	1.490	5.1	8	L	15 54.7	2.13	
9.0	289 31 32.1	3 6 40.4	15 23.7	56 23.98	1.598	5.6	9	U	4 20.1	2.11	
9.5	295 58 12.7	3 33 58.0	15 29.0	56 43.77	1.700	6.1	9	L	16 45.4	2.10	
10.0	302 29 39.5	3 58 50.1	15 34.8	57 4.75	1.795	6.6	10	U	5 10.4	2.08	
10.5	309 6 14.4	+4 20 52.2	15 40.8	57 26.79	+1.877	7.1	10	L	17 35.3	2.07	
11.0	315 48 16.8	4 39 40.0	15 47.0	57 49.72	1.940	7.6	11	U	6 0.1	2.07	
11.5	322 36 2.4	4 54 49.9	15 53.4	58 13.26	1.979	8.1	11	L	18 24.9	2.07	
12.0	329 29 42.1	5 5 59.5	15 59.9	58 37.10	1.988	8.6	12	U	6 49.7	2.07	
12.5	336 29 20.3	5 12 48.2	16 6.4	59 0.83	1.962	9.1	12	L	19 14.6	2.09	
13.0	343 34 54.0	+5 14 58.5	16 12.7	59 24.02	+1.894	9.6	13	U	7 39.9	2.12	
13.5	350 46 11.3	5 12 16.3	16 18.7	59 46.10	1.778	10.1	13	L	20 5.5	2.15	
14.0	358 2 50.9	5 4 32.9	16 24.3	60 6.48	1.612	10.6	14	U	8 31.6	2.20	
14.5	5 24 21.2	4 51 45.3	16 29.2	60 24.58	1.396	11.1	14	L	20 58.4	2.26	
15.0	12 50 0.3	4 33 57.8	16 33.4	60 39.79	1.131	11.6	15	U	9 25.8	2.32	
15.5	20 18 57.1	+4 11 22.3	16 36.6	60 51.56	+0.823	12.1	15	L	21 54.1	2.39	
16.0	27 50 12.2	+3 44 19.1	16 38.7	60 59.40	+0.477	12.6	16	U	10 23.1	2.45	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	" ' "	" ' "	" "	" "	"	d			h m	m	
Nov. 16.0	27 50 12.2	+3 44 19.1	16 38.7	60 59.40	+0.477	12.6	Nov. 16	U	10 23.1	2.45	
16.5	35 22 40.1	3 13 16.5	16 39.7	61 2.91	+0.105	13.1	16	L	22 52.9	2.51	
17.0	42 55 11.5	2 38 50.1	16 39.4	61 1.87	-0.280	13.6	17	U	11 23.3	2.55	
17.5	50 26 35.9	2 1 41.2	16 37.8	60 56.18	0.667	14.1	17	L	23 54.2	2.59	
18.0	57 55 44.8	1 22 35.7	16 35.0	60 45.93	1.036	14.6			.....	...
18.5	65 21 34.0	+0 42 21.2	16 31.1	60 31.43	-1.376	15.1	18	U	12 25.4	2.60	
19.0	72 43 6.2	+0 1 45.7	16 26.1	60 13.05	1.679	15.6	19	L	0 56.6	2.58	
19.5	79 59 32.0	-0 38 24.6	16 20.2	59 51.33	1.933	16.1	19	U	13 27.4	2.54	
20.0	87 10 12.4	1 17 27.5	16 13.5	59 26.87	2.132	16.6	20	L	1 57.7	2.49	
20.5	94 14 38.2	1 54 45.3	16 6.3	59 0.39	2.272	17.1	20	U	14 27.2	2.42	
21.0	101 12 30.8	-2 29 45.8	15 58.7	58 32.57	-2.355	17.6	21	L	2 55.8	2.34	
21.5	108 3 41.4	3 2 2.6	15 50.9	58 4.08	2.385	18.1	21	U	15 23.3	2.25	
22.0	114 48 10.5	3 31 15.1	15 43.2	57 35.53	2.364	18.6	22	L	3 49.7	2.15	
22.5	121 26 6.5	3 57 7.7	15 35.5	57 7.52	2.297	19.1	22	U	16 15.0	2.07	
23.0	127 57 45.1	4 19 29.5	15 28.2	56 40.56	2.193	19.6	23	L	4 39.4	1.99	
23.5	134 23 27.5	-4 38 13.9	15 21.2	56 15.02	-2.058	20.1	23	U	17 2.8	1.92	
24.0	140 43 39.5	4 53 17.2	15 14.7	55 51.29	1.894	20.6	24	L	5 25.5	1.86	
24.5	146 58 50.6	5 4 38.5	15 8.8	55 29.64	1.713	21.1	24	U	17 47.5	1.81	
25.0	153 9 32.4	5 12 19.0	15 3.6	55 10.24	1.518	21.6	25	L	6 9.0	1.77	
25.5	159 16 18.3	5 16 21.4	14 58.9	54 53.25	1.313	22.1	25	U	18 30.1	1.74	
26.0	165 19 42.7	-5 16 49.9	14 55.0	54 38.75	-1.103	22.6	26	L	6 50.9	1.71	
26.5	171 20 19.7	5 13 49.3	14 51.7	54 26.78	0.893	23.1	26	U	19 11.6	1.72	
27.0	177 18 43.2	5 7 25.6	14 49.1	54 17.31	0.686	23.6	27	L	7 32.2	1.72	
27.5	183 15 26.3	4 57 45.4	14 47.2	54 10.30	0.484	24.1	27	U	19 53.0	1.74	
28.0	189 11 0.6	4 44 56.0	14 46.0	54 5.66	0.290	24.6	28	L	8 13.9	1.75	
28.5	195 5 56.7	-4 29 5.7	14 45.3	54 3.30	-0.105	25.1	28	U	20 35.1	1.78	
29.0	201 0 42.6	4 10 23.6	14 45.3	54 3.09	+0.068	25.6	29	L	8 56.7	1.82	
29.5	206 55 44.8	3 48 59.7	14 45.7	54 4.88	0.228	26.1	29	U	21 18.7	1.85	
30.0	212 51 27.4	3 25 5.6	14 46.7	54 8.50	0.373	26.6	30	L	9 41.2	1.90	
30.5	218 48 12.7	2 58 53.7	14 48.2	54 13.79	0.506	27.1	30	U	22 4.3	1.95	
Dec. 1.0	224 46 20.6	-2 30 38.0	14 50.0	54 20.58	+0.623	27.6	Dec. 1	L	10 28.0	2.00	
1.5	230 46 8.7	2 0 34.4	14 52.2	54 28.70	0.728	28.1	1	U	22 52.2	2.04	
2.0	236 47 53.0	1 28 59.8	14 54.8	54 37.99	0.818	28.6	2	L	11 17.0	2.08	
2.5	242 51 47.4	0 56 13.2	14 57.6	54 48.29	0.897	29.1	2	U	23 42.2	2.11	
3.0	248 58 4.1	-0 22 34.8	15 0.6	54 59.47	0.964	29.6			.....	...
3.5	255 6 53.7	+0 11 33.6	15 3.9	55 11.38	+1.021	0.4	3	L	12 7.7	2.14	
4.0	261 18 25.8	0 45 48.8	15 7.3	55 23.95	1.071	0.9	4	U	0 33.6	2.16	
4.5	267 32 48.7	1 19 46.9	15 10.9	55 37.06	1.113	1.4	4	L	12 59.6	2.17	
5.0	273 50 9.9	1 53 2.8	15 14.6	55 50.64	1.151	1.9	5	U	1 25.6	2.16	
5.5	280 10 36.5	2 25 11.3	15 18.4	56 4.67	1.186	2.4	5	L	13 51.5	2.15	
6.0	286 34 15.1	+2 55 46.6	15 22.3	56 19.09	+1.217	2.9	6	U	2 17.2	2.13	
6.5	293 1 12.0	3 24 23.4	15 26.4	56 33.88	1.248	3.4	6	L	14 42.7	2.12	
7.0	299 31 33.6	3 50 36.7	15 30.5	56 49.05	1.280	3.9	7	U	3 8.0	2.09	
7.5	306 5 25.8	4 14 2.4	15 34.7	57 4.60	1.311	4.4	7	L	15 32.9	2.07	
8.0	312 42 54.5	4 34 17.8	15 39.1	57 20.49	1.336	4.9	8	U	3 57.6	2.04	
8.5	319 24 5.0	+4 51 1.4	15 43.6	57 36.64	+1.357	5.4	8	L	16 22.0	2.03	
9.0	326 9 2.0	+5 3 53.9	15 47.9	57 53.04	+1.375	5.9	9	U	4 46.3	2.02	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
							Dec.	h m	m	
ec. 9.0	326 9 2.0	+5 3 53.9	15 47.9	57 53.04	+1.375	5.9	Dec. 9	U	4 46.3	2.02
9.5	332 57 48.8	5 12 38.3	15 52.4	58 9.61	1.383	6.4	9	L	17 10.6	2.02
10.0	339 50 27.1	5 17 0.1	15 57.0	58 26.17	1.377	6.9	10	U	5 34.9	2.03
10.5	346 46 56.1	5 16 48.3	16 1.4	58 42.60	1.357	7.4	10	L	17 59.4	2.05
11.0	353 47 12.0	5 11 55.5	16 5.8	58 58.64	1.313	7.9	11	U	6 24.2	2.09
11.5	0 51 7.7	+5 2 18.5	16 10.0	59 14.00	+1.244	8.4	11	L	18 49.5	2.13
12.0	7 58 31.4	4 47 59.1	16 13.9	59 28.39	1.147	8.9	12	U	7 15.3	2.18
12.5	15 9 6.7	4 29 4.2	16 17.5	59 41.42	1.019	9.4	12	L	19 41.8	2.24
13.0	22 22 32.2	4 5 46.4	16 20.5	59 52.71	0.858	9.9	13	U	8 9.0	2.30
13.5	29 38 20.6	3 38 24.4	16 23.0	60 1.89	0.666	10.4	13	L	20 37.0	2.37
14.0	36 55 59.7	+3 7 23.0	16 24.9	60 8.56	+0.440	10.9	14	U	9 5.8	2.43
14.5	44 14 52.2	2 33 12.5	16 25.9	60 12.34	+0.188	11.4	14	L	21 35.3	2.49
15.0	51 34 16.3	1 56 28.4	16 26.1	60 12.98	-0.084	11.9	15	U	10 5.5	2.54
15.5	58 53 26.9	1 17 50.6	16 25.3	60 10.27	0.370	12.4	15	L	22 36.1	2.56
16.0	66 11 37.0	+0 38 1.6	16 23.6	60 4.08	0.661	12.9	16	U	11 6.9	2.57
16.5	73 27 58.8	-0 2 14.2	16 21.0	59 54.44	-0.945	13.4	16	L	23 37.6	2.55
17.0	80 41 45.2	0 42 12.6	16 17.5	59 41.47	1.213	13.9				
17.5	87 52 12.0	1 21 11.5	16 13.1	59 25.42	1.457	14.4	17	U	12 7.9	2.52
18.0	94 58 38.4	1 58 31.4	16 8.0	59 6.63	1.667	14.9	18	L	0 37.7	2.45
18.5	102 0 28.9	2 33 37.3	16 2.2	58 45.56	1.839	15.4	18	U	13 6.6	2.38
19.0	108 57 14.8	-3 5 59.4	15 56.0	58 22.67	-1.968	15.9	19	L	1 34.7	2.30
19.5	115 48 33.8	3 35 13.1	15 49.4	57 58.51	2.051	16.4	19	U	14 1.7	2.20
20.0	122 34 11.1	4 0 59.8	15 42.6	57 33.62	2.089	16.9	20	L	2 27.6	2.12
20.5	129 13 59.6	4 23 6.1	15 35.8	57 8.56	2.081	17.4	20	U	14 52.6	2.04
21.0	135 47 59.4	4 41 23.3	15 29.1	56 43.83	2.034	17.9	21	L	3 16.7	1.97
21.5	142 16 17.6	-4 55 47.5	15 22.5	56 19.89	-1.948	18.4	21	U	15 39.9	1.90
22.0	148 39 7.6	5 6 17.9	15 16.4	55 57.20	1.829	18.9	22	L	4 2.4	1.85
22.5	154 56 48.5	5 12 57.1	15 10.6	55 36.10	1.683	19.4	22	U	16 24.4	1.81
23.0	161 9 44.0	5 15 49.8	15 5.4	55 16.91	1.513	19.9	23	L	4 45.9	1.77
23.5	167 18 22.4	5 15 2.3	15 0.7	54 59.87	1.325	20.4	23	U	17 7.0	1.75
24.0	173 23 14.7	-5 10 42.3	14 56.7	54 45.17	-1.122	20.9	24	L	5 28.0	1.74
24.5	179 24 54.6	5 2 58.2	14 53.4	54 32.98	0.908	21.4	24	U	17 48.8	1.74
25.0	185 23 57.5	4 51 59.4	14 50.8	54 23.39	0.690	21.9	25	L	6 9.8	1.75
25.5	191 21 0.2	4 37 55.4	14 48.9	54 16.43	0.470	22.4	25	U	18 30.8	1.76
26.0	197 16 39.8	4 20 56.3	14 47.7	54 12.12	0.249	22.9	26	L	6 52.1	1.79
26.5	203 11 33.5	-4 1 12.5	14 47.3	54 10.43	-0.034	23.4	26	U	19 13.8	1.82
27.0	209 6 17.9	3 38 55.3	14 47.5	54 11.26	+0.172	23.9	27	L	7 35.9	1.86
27.5	215 1 28.8	3 14 16.3	14 48.4	54 14.52	0.370	24.4	27	U	19 58.4	1.90
28.0	220 57 40.4	2 47 27.9	14 49.9	54 20.09	0.556	24.9	28	L	8 21.6	1.95
28.5	226 55 25.3	2 18 44.0	14 52.0	54 27.80	0.726	25.4	28	U	20 45.3	2.00
29.0	232 55 13.3	-1 48 19.5	14 54.6	54 37.44	+0.878	25.9	29	L	9 9.6	2.05
29.5	238 57 32.0	1 16 30.6	14 57.7	54 48.79	1.011	26.4	29	U	21 34.5	2.09
30.0	245 2 46.1	0 43 35.5	15 1.2	55 1.63	1.126	26.9	30	L	9 59.8	2.13
30.5	251 11 16.8	-0 9 54.0	15 5.0	55 15.72	1.218	27.4	30	U	22 25.6	2.17
31.0	257 23 21.2	+0 24 12.2	15 9.1	55 30.76	1.288	27.9	31	L	10 51.8	2.19
31.5	263 39 13.0	+0 58 19.9	15 13.4	55 46.53	+1.336	28.4	31	U	23 18.1	2.20
32.0	269 59 2.0	+1 32 4.0	15 17.9	56 2.73	+1.361	28.9	32	L	11 44.5	2.23

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.	
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.		
	h m s	s	° ' "	"			"	"	h m	
Jan.	1	19 2 53.57	-13.675	-20 28 44.2	+22.65	9.833 9126	-2120.4	4.90	12.90	0 21.4
	2	18 57 16.17	14.366	20 20 21.5	19.24	9.829 7745	1321.4	4.94	13.02	0 11.9
	3	18 51 27.74	14.591	20 13 21.5	15.75	9.827 5886	- 499.0	4.97	13.09	0 2.3
	4	18 45 39.54	14.349	20 7 46.1	12.18	9.827 3712	+ 313.5	4.97	13.09	23 43.1
	5	18 40 2.44	13.675	20 3 37.6	8.52	9.829 0600	1084.5	4.95	13.04	23 33.9
	6	18 34 46.16	-12.626	-20 0 57.6	+ 4.81	9.832 5230	+1788.3	4.91	12.94	23 25.2
	7	18 29 58.79	11.279	19 59 46.9	+ 1.08	9.837 5749	2406.2	4.86	12.79	23 17.1
	8	18 25 46.46	9.720	20 0 5.1	- 2.58	9.843 9959	2928.2	4.78	12.60	23 9.6
	9	18 22 13.31	8.027	20 1 49.5	6.09	9.851 5511	3351.5	4.70	12.39	23 2.8
	10	18 19 21.63	6.275	20 4 55.5	9.36	9.860 0067	3679.6	4.61	12.15	22 56.7
	11	18 17 12.15	- 4.519	-20 9 16.6	-12.34	9.869 1432	+3920.3	4.52	11.89	22 51.3
	12	18 15 44.36	2.807	20 14 44.7	14.94	9.878 7621	4063.5	4.42	11.63	22 46.6
	13	18 14 56.82	- 1.169	20 21 10.3	17.12	9.888 6912	4180.6	4.32	11.37	22 42.5
	14	18 14 47.48	+ 0.374	20 28 23.1	18.88	9.898 7851	4222.7	4.22	11.11	22 38.9
	15	18 15 13.94	1.812	20 36 12.9	20.19	9.908 9244	4220.2	4.12	10.85	22 36.0
	16	18 16 13.58	+ 3.139	-20 44 29.0	-21.08	9.919 0136	+4182.2	4.02	10.60	22 33.5
	17	18 17 43.75	4.357	20 53 1.4	21.55	9.928 9770	4116.8	3.93	10.36	22 31.5
	18	18 19 41.88	5.499	21 1 40.4	21.64	9.938 7577	4030.8	3.84	10.13	22 29.9
	19	18 22 5.48	6.481	21 10 17.0	21.36	9.948 3128	3929.7	3.76	9.91	22 28.7
	20	18 24 52.23	7.400	21 18 43.0	20.75	9.957 6118	3818.0	3.68	9.70	22 27.9
	21	18 27 59.98	+ 8.233	-21 26 50.5	-19.84	9.966 6335	+3699.2	3.61	9.50	22 27.4
	22	18 31 26.77	8.987	21 34 32.9	18.65	9.975 3646	3576.2	3.54	9.31	22 27.2
	23	18 35 10.80	9.671	21 41 43.9	17.22	9.983 7976	3451.2	3.47	9.13	22 27.2
	24	18 39 10.46	10.290	21 48 17.8	15.57	9.991 9300	3323.8	3.40	8.96	22 27.5
	25	18 43 24.27	10.851	21 54 9.7	13.72	9.999 7622	3201.3	3.34	8.80	22 27.9
	26	18 47 50.91	+11.361	-21 59 15.1	-11.70	0.007 2976	+3078.6	3.28	8.65	22 28.6
	27	18 52 29.20	11.823	22 3 30.1	9.52	0.014 5416	2958.6	3.23	8.51	22 29.5
	28	18 57 18.06	12.242	22 6 51.1	7.21	0.021 5011	2841.5	3.18	8.38	22 30.5
	29	19 2 16.53	12.624	22 9 15.0	4.77	0.028 1832	2727.6	3.13	8.25	22 31.7
	30	19 7 23.74	12.971	22 10 39.0	- 2.22	0.034 5965	2617.4	3.08	8.13	22 33.0
Feb.	31	19 12 38.91	+13.288	-22 11 0.6	+ 0.43	0.040 7496	+2510.7	3.04	8.01	22 34.4
	1	19 18 1.33	13.576	22 10 17.7	3.16	0.046 6508	2407.6	3.00	7.90	22 36.0
	2	19 23 30.37	13.840	22 8 28.2	5.97	0.052 3091	2308.1	2.96	7.80	22 37.6
	3	19 29 5.46	14.081	22 5 30.4	8.85	0.057 7327	2212.1	2.92	7.70	22 39.3
	4	19 34 46.07	14.300	22 1 22.9	11.79	0.062 9300	2119.6	2.89	7.61	22 41.1
	5	19 40 31.72	+14.501	-21 56 4.2	+14.78	0.067 9092	+2030.3	2.86	7.52	22 43.0
	6	19 46 22.00	14.686	21 49 33.0	17.82	0.072 6778	1944.0	2.83	7.44	22 45.0
	7	19 52 16.51	14.854	21 41 48.4	20.90	0.077 2427	1860.6	2.80	7.36	22 47.0
	8	19 58 14.90	15.009	21 32 49.4	24.02	0.081 6111	1780.1	2.77	7.29	22 49.1
	9	20 4 16.84	15.151	21 22 35.1	27.17	0.085 7893	1702.2	2.74	7.22	22 51.3
	10	20 10 22.05	+15.281	-21 11 4.8	+30.36	0.089 7835	+1626.6	2.72	7.16	22 53.5
	11	20 16 30.27	15.402	20 58 17.8	33.56	0.093 5990	1553.3	2.69	7.09	22 55.7
	12	20 22 41.25	15.512	20 44 13.6	36.79	0.097 2412	1482.1	2.67	7.03	22 58.0
	13	20 28 54.78	15.614	20 28 51.5	40.05	0.100 7148	1412.8	2.65	6.97	23 0.3
	14	20 35 10.67	15.709	20 12 11.3	43.31	0.104 0241	1345.2	2.63	6.92	23 2.7
	15	20 41 28.74	+15.796	-19 54 12.5	+46.60	0.107 1728	+1279.1	2.61	6.87	23 5.1
16	20 47 48.85	+15.878	-19 34 54.6	+49.90	0.110 1646	+1214.2	2.59	6.83	23 7.5	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Feb. 16	20	47	48.85	+15.878	-19	34	54.6	+ 49.90	0.110 1646	+1214.2	2.59	6.83	23 7.5
17	20	54	10.86	15.955	19	14	17.4	53.20	0.113 0020	1180.5	2.57	6.79	23 9.9
18	21	0	34.66	16.027	18	52	20.7	56.52	0.115 6876	1087.7	2.56	6.74	23 12.4
19	21	7	0.15	16.096	18	29	4.1	59.86	0.118 2235	1025.6	2.54	6.70	23 14.9
20	21	13	27.25	16.162	18	4	27.5	63.19	0.120 6108	963.9	2.52	6.66	23 17.5
21	21	19	55.90	+16.235	-17	38	30.7	+ 66.54	0.122 8504	+ 902.4	2.51	6.63	23 20.0
22	21	26	26.04	16.286	17	11	13.5	69.89	0.124 9425	841.0	2.50	6.60	23 22.6
23	21	32	57.62	16.346	16	42	35.8	73.25	0.126 8868	779.2	2.49	6.57	23 25.2
24	21	39	30.63	16.406	16	12	37.6	76.60	0.128 6824	717.0	2.48	6.54	23 27.9
25	21	46	5.05	16.463	15	41	18.9	79.95	0.130 3277	654.0	2.47	6.52	23 30.5
26	21	52	40.87	+16.522	-15	8	39.6	+ 83.31	0.131 8205	+ 589.8	2.47	6.50	23 33.2
27	21	59	18.11	16.581	14	34	39.8	86.67	0.133 1575	524.2	2.46	6.48	23 35.9
28	22	5	56.78	16.641	13	59	19.6	90.01	0.134 3355	457.0	2.45	6.46	23 38.7
Mr. 1	22	12	36.90	16.702	13	22	39.3	93.35	0.135 3494	387.6	2.45	6.44	23 41.4
2	22	19	18.51	16.765	12	44	39.1	96.67	0.136 1943	315.9	2.44	6.43	23 44.2
3	22	26	1.65	+16.830	-12	5	19.4	+ 99.97	0.136 8636	+ 241.4	2.44	6.42	23 47.0
4	22	32	46.36	16.896	11	24	40.5	103.26	0.137 3504	163.6	2.43	6.41	23 49.8
5	22	39	32.68	16.964	10	42	43.2	106.51	0.137 6458	+ 81.9	2.43	6.41	23 52.7
6	22	46	20.67	17.035	9	59	28.3	109.73	0.137 7404	- 3.8	2.43	6.41	23 55.6
7	22	53	10.36	17.107	9	14	56.5	112.91	0.137 6237	94.2	2.43	6.41	23 58.5
8	23	0	1.81	+17.181	- 8	29	9.3	+116.02	0.137 2840	- 189.9	2.43	6.41	...
9	23	6	55.03	17.255	7	42	8.0	119.08	0.136 7074	291.4	2.44	6.42	0 1.5
10	23	13	50.04	17.329	6	53	54.3	122.05	0.135 8800	399.4	2.45	6.44	0 4.4
11	23	20	46.84	17.404	6	4	30.6	124.91	0.134 7849	514.4	2.45	6.45	0 7.5
12	23	27	45.40	17.476	5	13	59.4	127.67	0.133 4051	636.8	2.46	6.47	0 10.5
13	23	34	45.66	+17.545	- 4	22	23.8	+130.27	0.131 7217	- 767.5	2.47	6.50	0 13.6
14	23	41	47.51	17.609	3	29	47.6	132.71	0.129 7140	906.9	2.48	6.53	0 16.7
15	23	48	50.81	17.665	2	36	15.2	134.95	0.127 3611	1055.5	2.49	6.56	0 19.8
16	23	55	55.34	17.711	1	41	51.8	136.96	0.124 6398	1213.8	2.50	6.60	0 22.9
17	0	3	0.83	17.744	- 0	46	43.4	138.69	0.121 5268	1382.0	2.52	6.65	0 26.1
18	0	10	6.92	+17.780	+ 0	9	2.9	+140.11	0.117 9979	-1560.4	2.54	6.71	0 29.2
19	0	17	13.15	17.756	1	5	19.2	141.18	0.114 0291	1748.6	2.57	6.77	0 32.4
20	0	24	18.99	17.726	2	1	56.4	141.85	0.109 5970	1946.4	2.60	6.84	0 35.6
21	0	31	23.76	17.696	2	58	44.4	142.07	0.104 6788	2153.4	2.63	6.92	0 38.7
22	0	38	26.69	17.572	3	55	31.9	141.80	0.099 2541	2368.4	2.66	7.00	0 41.8
23	0	45	26.88	+17.437	+ 4	52	6.6	+141.00	0.093 3051	-2590.1	2.70	7.09	0 44.9
24	0	52	23.32	17.259	5	48	15.4	139.64	0.086 8171	2817.1	2.74	7.20	0 47.9
25	0	59	14.90	17.031	6	43	44.5	137.69	0.079 7806	3047.0	2.78	7.32	0 50.8
26	1	6	0.37	16.750	7	38	19.5	135.13	0.072 1909	3277.7	2.83	7.45	0 53.6
27	1	12	38.44	16.413	8	31	45.8	131.96	0.064 0490	3506.7	2.88	7.59	0 56.3
28	1	19	7.74	+16.019	+ 9	23	48.7	+128.19	0.055 3623	-3781.3	2.94	7.75	0 58.9
29	1	25	26.87	15.565	10	14	14.1	123.83	0.046 1443	3949.0	3.00	7.91	1 1.2
30	1	31	34.39	15.052	11	2	48.3	118.93	0.036 4149	4157.0	3.07	8.09	1 3.4
31	1	37	28.92	14.482	11	49	18.5	113.51	0.026 2005	4352.9	3.15	8.28	1 5.4
Apr. 1	1	43	9.06	13.854	12	33	33.1	107.63	0.015 5321	4534.8	3.23	8.49	1 7.1
2	1	48	33.50	+13.174	+13	15	21.4	+101.33	0.004 4465	-4700.4	3.31	8.71	1 8.5
3	1	53	41.00	+12.443	+13	54	34.1	+ 94.67	9.992 9844	-4848.2	3.40	8.94	1 11.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter	Hor. Parallax.	Trans. Merid. of Greenwich
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
Apr.	h m s	s	° ' "	"									h
	1 43 9.06	+12.884	+12 33 33.1	+107.63	0.015 5321	-4534.8	3.23	8.49	1				
	2 1 48 33.50	12.174	13 15 21.4	101.33	0.004 4465	4700.4	3.31	8.71	1				
	3 1 53 41.00	12.443	13 54 34.1	94.67	9.992 9844	4848.2	3.40	8.94	1				
	4 1 58 30.38	11.665	14 31 3.0	87.69	9.981 1903	4976.9	3.49	9.19	1				
	5 2 3 0.56	10.844	15 4 41.0	80.44	9.969 1116	5085.2	3.59	9.45	1				
	6 2 7 10.56	+ 9.984	+15 35 22.2	+ 72.96	9.956 7985	-5172.1	3.69	9.72	1				
	7 2 10 59.49	9.089	16 3 1.4	65.28	9.944 3036	5286.5	3.80	10.00	1				
	8 2 14 26.58	8.164	16 27 34.3	57.44	9.931 6816	5378.0	3.91	10.29	1				
	9 2 17 31.16	7.214	16 48 57.4	49.46	9.918 9885	5485.5	4.02	10.60	1				
	10 2 20 12.67	6.243	17 7 7.6	41.37	9.906 2833	5587.9	4.14	10.92	1				
	11 2 22 30.70	+ 5.258	+17 22 2.3	+ 33.17	9.893 6270	-5684.6	4.27	11.24	1				
	12 2 24 24.98	4.264	17 33 39.5	24.92	9.881 0824	5194.7	4.39	11.57	1				
	13 2 25 55.37	3.269	17 41 58.0	16.61	9.868 7145	5107.1	4.52	11.91	1				
	14 2 27 1.93	2.280	17 46 56.7	+ 8.29	9.856 5913	4990.8	4.64	12.24	0				
	15 2 27 44.93	1.306	17 48 35.9	- 0.02	9.844 7822	4846.1	4.77	12.58	0				
	16 2 28 4.81	+ 0.356	+17 46 56.5	- 8.26	9.833 3589	-4668.2	4.90	12.92	0				
	17 2 28 2.31	- 0.558	17 42 0.5	16.38	9.822 3942	4462.9	5.03	13.25	0				
	18 2 27 38.39	1.427	17 33 51.8	24.31	9.811 9616	4225.9	5.15	13.57	0				
	19 2 26 54.27	2.239	17 22 35.6	31.98	9.802 1338	3959.0	5.27	13.88	0				
	20 2 25 51.46	2.982	17 8 19.7	39.28	9.792 9816	3663.0	5.38	14.17	0				
	21 2 24 31.74	- 3.647	+16 51 13.6	- 46.14	9.784 5732	-3339.5	5.49	14.45	0				
	22 2 22 57.10	4.223	16 31 29.5	52.43	9.776 9718	2991.0	5.59	14.71	0				
	23 2 21 9.81	4.701	16 9 22.1	58.07	9.770 2338	2620.5	5.67	14.94	0				
	24 2 19 12.29	5.075	15 45 8.4	62.94	9.764 4079	2231.8	5.75	15.14	0				
	25 2 17 7.10	5.339	15 19 8.0	66.95	9.759 5323	1829.1	5.81	15.31	0				
	26 2 14 56.91	- 5.492	+14 51 42.3	- 70.03	9.755 6352	-1417.5	5.86	15.45	0				
	27 2 12 44.38	5.534	14 23 14.2	72.14	9.752 7315	1001.8	5.90	15.55	23				
	28 2 10 32.17	5.466	13 54 7.8	73.23	9.750 8255	587.2	5.93	15.62	23				
	29 2 8 22.82	5.296	13 24 47.3	73.30	9.749 9077	- 179.0	5.94	15.65	23				
30 2 6 18.73	5.030	12 55 37.2	72.38	9.749 9576	+ 218.2	5.94	15.65	23					
May	2 4 22.10	- 4.676	+12 27 0.7	- 70.51	9.750 9429	+ 600.0	5.92	15.61	23				
	2 2 34.91	4.245	11 59 19.7	67.77	9.752 8228	963.2	5.89	15.54	23				
	2 0 58.87	3.747	11 32 54.1	64.24	9.755 5487	1204.5	5.86	15.45	23				
	1 59 35.47	3.195	11 8 2.0	60.00	9.759 0654	1621.9	5.81	15.33	23				
	1 58 25.89	2.698	10 44 58.6	55.19	9.763 3136	1914.0	5.76	15.18	23				
	1 57 31.08	- 1.966	+10 23 56.8	- 49.89	9.768 2320	+2180.3	5.70	15.01	22				
	1 56 51.73	1.310	10 5 6.9	44.21	9.773 7582	2420.6	5.63	14.82	22				
	1 56 28.34	- 0.637	9 48 36.8	38.26	9.779 8307	2635.5	5.55	14.61	22				
	1 56 21.21	+ 0.044	9 34 32.0	32.12	9.786 3890	2825.8	5.47	14.39	22				
	1 56 30.45	0.726	9 22 55.9	25.87	9.793 3759	2992.9	5.38	14.16	22				
	1 56 56.06	+ 1.407	+ 9 13 50.3	- 19.59	9.800 7376	+3138.3	5.29	13.92	22				
	1 57 37.92	2.080	9 7 15.3	13.34	9.808 4234	3263.4	5.20	13.68	22				
	1 58 35.82	2.743	9 3 9.6	7.15	9.816 3870	3369.9	5.10	13.43	22				
	1 59 49.47	2.393	9 1 31.0	- 1.09	9.824 5856	3459.7	5.01	13.18	22				
	2 1 18.56	4.029	9 2 16.3	+ 4.83	9.832 9812	3534.2	4.91	12.93	22				
	2 3 2.75	+ 4.650	+ 9 5 21.5	+ 10.57	9.841 5387	+3594.9	4.82	12.67	22				
	2 5 1.64	+ 5.255	+ 9 10 42.2	+ 16.12	9.850 2267	+3643.1	4.72	12.42	22				

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	"							h	m
May 17	2	5	1.64	+ 5.255	+ 9	10	42.2	+16.12	9.850 2267	+3643.1	4.72	12.42	22 25.9
18	2	7	14.87	5.845	9	18	13.6	21.46	9.859 0175	3680.6	4.63	12.17	22 24.4
19	2	9	42.07	6.419	9	27	50.5	26.58	9.867 8859	3708.2	4.53	11.93	22 23.1
20	2	12	22.88	6.980	9	39	27.6	31.47	9.876 8102	3737.2	4.44	11.69	22 22.1
21	2	15	16.98	7.526	9	52	59.4	36.14	9.885 7705	3768.5	4.35	11.45	22 21.2
22	2	18	24.04	+ 8.080	+10	8	20.4	+40.57	9.894 7492	+3742.7	4.26	11.21	22 20.6
23	2	21	43.79	8.584	10	25	25.0	44.77	9.903 7305	3740.9	4.17	10.98	22 20.2
24	2	25	15.98	9.097	10	44	7.7	48.74	9.912 7009	3733.6	4.08	10.76	22 20.0
25	2	29	0.39	9.602	11	4	22.9	52.49	9.921 6475	3721.1	4.00	10.54	22 20.0
26	2	32	56.85	10.101	11	26	5.1	56.00	9.930 5584	3704.0	3.92	10.33	22 20.2
27	2	37	5.21	+10.595	+11	49	8.9	+59.28	9.939 4234	+3682.7	3.84	10.12	22 20.5
28	2	41	25.39	11.085	12	13	28.8	62.34	9.948 2322	3657.3	3.76	9.92	22 21.1
29	2	45	57.29	11.573	12	38	59.2	65.16	9.956 9752	3628.0	3.69	9.72	22 21.9
30	2	50	40.91	12.061	13	5	34.6	67.76	9.965 6433	3594.7	3.62	9.53	22 22.9
31	2	55	36.25	12.551	13	33	9.7	70.12	9.974 2270	3557.7	3.55	9.34	22 24.0
June 1	3	0	43.36	+13.042	+14	1	38.7	+72.25	9.982 7171	+3516.8	3.48	9.16	22 25.4
2	3	6	2.29	13.537	14	30	55.9	74.14	9.991 1043	3471.8	3.41	8.98	22 26.9
3	3	11	33.16	14.037	15	0	55.3	75.77	9.999 3781	3422.4	3.34	8.81	22 28.7
4	3	17	16.10	14.543	15	31	31.0	77.16	0.007 5280	3368.4	3.28	8.65	22 30.7
5	3	23	11.26	15.055	16	2	36.6	78.26	0.015 5429	3309.7	3.22	8.49	22 32.8
6	3	29	18.81	+15.575	+16	34	5.4	+79.09	0.023 4104	+3245.7	3.17	8.34	22 35.2
7	3	35	38.94	16.104	17	5	50.6	79.62	0.031 1177	3175.9	3.11	8.19	22 37.8
8	3	42	11.84	16.639	17	37	44.7	79.83	0.038 6499	3099.9	3.06	8.05	22 40.6
9	3	48	57.68	17.182	18	9	39.9	79.71	0.045 9916	3017.1	3.01	7.92	22 43.7
10	3	55	56.64	17.732	18	41	28.0	79.23	0.053 1260	2926.9	2.96	7.79	22 46.9
11	4	3	8.86	+18.287	+19	13	0.1	+78.37	0.060 0345	+2828.9	2.91	7.67	22 50.4
12	4	10	34.42	18.844	19	44	6.8	77.11	0.066 6977	2722.3	2.87	7.55	22 54.1
13	4	18	13.36	19.401	20	14	38.0	75.42	0.073 0944	2606.7	2.82	7.44	22 58.0
14	4	26	5.63	19.954	20	44	23.2	73.27	0.079 2023	2481.6	2.78	7.33	23 2.2
15	4	34	11.09	20.499	21	13	11.1	70.64	0.084 9985	2346.8	2.75	7.23	23 6.6
16	4	42	29.46	+21.029	+21	40	50.2	+67.53	0.090 4590	+2202.0	2.72	7.14	23 11.1
17	4	51	0.32	21.539	22	7	8.6	63.91	0.095 5601	2047.2	2.69	7.06	23 15.9
18	4	59	43.11	22.022	22	31	54.0	59.78	0.100 2784	1882.8	2.66	6.99	23 20.9
19	5	8	37.08	22.469	22	54	54.2	55.16	0.104 5912	1709.5	2.63	6.92	23 26.0
20	5	17	41.30	22.875	23	15	57.6	50.04	0.108 4777	1527.9	2.60	6.85	23 31.3
21	5	26	54.68	+23.231	+23	34	52.6	+44.47	0.111 9198	+1339.4	2.58	6.80	23 36.8
22	5	36	15.92	23.530	23	51	28.8	38.48	0.114 9025	1145.4	2.56	6.75	23 42.3
23	5	45	43.62	23.767	24	5	36.9	32.14	0.117 4146	947.5	2.54	6.71	23 47.9
24	5	55	16.23	23.938	24	17	9.0	25.50	0.119 4489	747.6	2.53	6.68	23 53.6
25	6	4	52.10	24.040	24	25	58.9	18.63	0.121 0032	547.8	2.52	6.66	23 59.3
26	6	14	29.57	+24.071	+24	32	2.0	+11.62	0.122 0800	+ 349.9	2.52	6.64	...
27	6	24	6.96	24.033	24	35	16.0	+ 4.54	0.122 6857	+ 155.7	2.51	6.63	0 5.0
28	6	33	42.62	23.928	24	35	40.2	- 2.52	0.122 8319	- 32.9	2.51	6.63	0 10.7
29	6	43	15.00	23.760	24	33	15.7	9.50	0.122 5331	214.9	2.52	6.64	0 16.3
30	6	52	42.65	23.535	24	28	5.5	16.32	0.121 8067	388.9	2.52	6.65	0 21.8
July 1	7	2	4.26	+23.257	+24	20	13.7	-22.95	0.120 6733	- 554.1	2.53	6.67	0 27.3
2	7	11	18.65	+22.935	+24	9	46.0	-29.31	0.119 1544	- 710.1	2.54	6.69	0 32.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	"						
July	1	2	3	4	5	6	7	8	9	10	11	12	13
	7	2	4.26	+23.257	+24	20	13.7	-22.95	0.120 6733	-554.1	2.53	6.67	0 27.3
	7	11	18.65	22.935	24	9	46.0	29.31	0.119 1544	710.1	2.54	6.69	0 32.6
	7	20	24.84	22.575	23	56	49.0	35.38	0.117 2724	856.6	2.55	6.72	0 37.8
	7	29	21.97	22.181	23	41	30.1	41.14	0.115 0502	993.6	2.56	6.75	0 42.8
	5	7	38 9.34	21.762	23	23	57.1	46.56	0.112 5106	1121.2	2.58	6.79	0 47.6
	6	7	46 46.41	+21.324	+23	4	18.2	-51.62	0.109 6754	-1239.9	2.60	6.84	0 52.3
	7	7	55 12.75	20.870	22	42	41.9	56.34	0.106 5658	1350.1	2.62	6.89	0 56.8
	8	8	3 28.07	20.405	22	19	16.5	60.72	0.103 2015	1452.2	2.64	6.94	1 1.1
	9	8	11 32.15	19.934	21	54	10.3	64.74	0.099 6010	1547.0	2.66	7.00	1 5.3
	10	8	19 24.88	19.460	21	27	31.5	68.43	0.095 7813	1635.0	2.68	7.06	1 9.2
	11	8	27 6.22	+18.985	+20	59	28.1	-71.80	0.091 7581	-1716.8	2.71	7.12	1 12.9
	12	8	34 36.18	18.512	20	30	7.7	74.85	0.087 5452	1793.0	2.74	7.19	1 16.5
	13	8	41 54.82	18.042	19	59	37.5	77.61	0.083 1555	1864.3	2.76	7.26	1 19.9
	14	8	49 2.23	17.576	19	28	4.7	80.08	0.078 6002	1931.2	2.79	7.34	1 23.0
	15	8	55 58.54	17.117	18	55	35.8	82.28	0.073 8890	1994.2	2.82	7.42	1 26.0
	16	9	2 43.89	+16.663	+18	22	17.4	-84.21	0.069 0307	-2053.8	2.85	7.51	1 28.8
	17	9	9 18.42	16.216	17	48	15.5	85.90	0.064 0330	2110.5	2.88	7.59	1 31.5
	18	9	15 42.29	15.775	17	13	35.9	87.36	0.058 9022	2164.7	2.91	7.68	1 33.9
	19	9	21 55.65	15.340	16	38	24.2	88.58	0.053 6441	2216.7	2.95	7.77	1 36.2
	20	9	27 58.65	14.911	16	2	45.6	89.60	0.048 2632	2267.0	2.99	7.87	1 38.3
	21	9	33 51.44	+14.488	+15	26	45.3	-90.39	0.042 7635	-2315.8	3.02	7.97	1 40.2
	22	9	39 34.12	14.070	14	50	28.3	90.99	0.037 1482	2363.4	3.06	8.08	1 42.0
	23	9	45 6.83	13.656	14	13	59.2	91.40	0.031 4199	2410.0	3.10	8.19	1 43.6
	24	9	50 29.64	13.245	13	37	22.6	91.62	0.025 5809	2455.8	3.15	8.30	1 45.0
	25	9	55 42.61	12.837	13	0	43.0	91.65	0.019 6326	2501.1	3.19	8.41	1 46.3
	26	10	0 45.84	+12.431	+12	24	4.9	-91.49	0.013 5758	-2546.0	3.24	8.53	1 47.4
	27	10	5 39.31	12.025	11	47	32.7	91.16	0.007 4119	2590.6	3.28	8.65	1 48.3
	28	10	10 23.04	11.619	11	11	10.5	90.65	0.001 1409	2635.1	3.33	8.78	1 49.1
	29	10	14 56.98	11.210	10	35	2.8	89.96	9.994 7635	2679.4	3.38	8.91	1 49.7
	30	10	19 21.07	10.797	9	59	14.0	89.08	9.988 2799	2723.6	3.44	9.04	1 50.1
Aug.	31	10	23 35.21	+10.380	+9	23	48.4	-88.02	9.981 6903	-2767.7	3.49	9.18	1 50.4
	1	10	27 39.26	9.957	8	48	50.5	86.77	9.974 9950	2811.7	3.54	9.32	1 50.5
	2	10	31 33.08	9.526	8	14	25.1	85.31	9.968 1944	2855.3	3.59	9.47	1 50.5
	3	10	35 16.41	9.084	7	40	37.0	83.66	9.961 2900	2898.3	3.65	9.62	1 50.2
	4	10	38 49.04	8.632	7	7	31.0	81.80	9.954 2830	2940.7	3.71	9.78	1 49.8
	5	10	42 10.66	+8.167	+6	35	12.5	-79.71	9.947 1756	-2981.9	3.78	9.94	1 49.2
	6	10	45 20.92	7.686	6	3	46.8	77.39	9.939 9710	3021.7	3.84	10.11	1 48.4
	7	10	48 19.46	7.189	5	33	19.8	74.82	9.932 6731	3059.4	3.90	10.28	1 47.4
	8	10	51 5.83	6.672	5	3	57.6	71.99	9.925 2879	3094.5	3.96	10.45	1 46.3
	9	10	53 39.55	6.135	4	35	46.6	68.88	9.917 8223	3126.2	4.03	10.63	1 44.9
	10	10	56 0.13	+5.575	+4	8	53.7	-65.48	9.910 2857	-3153.5	4.10	10.82	1 43.2
	11	10	58 6.97	4.991	3	43	26.2	61.76	9.902 6896	3175.6	4.17	11.01	1 41.4
	12	10	59 59.50	4.381	3	19	31.8	57.71	9.895 0481	3191.1	4.25	11.21	1 39.3
	13	11	1 37.05	3.744	2	57	18.7	53.31	9.887 3788	3198.6	4.33	11.41	1 37.0
	14	11	2 58.98	3.079	2	36	55.7	48.54	9.879 7028	3196.3	4.40	11.61	1 34.4
	15	11	4 4.59	+2.384	+2	18	31.9	-43.38	9.872 0458	-3182.4	4.48	11.81	1 31.6
	16	11	4 53.19	+1.661	+2	2	16.9	-37.80	9.864 4381	-3154.9	4.56	12.02	1 28.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	° ' "	"		"	"	"	h m
g. 16	11	4	53.19	+ 1.661	+2 2 16.9	- 37.80	9.864 4381	-3154.9	4.56	12.02	1 28.4
17	11	5	24.10	0.910	1 48 20.7	31.61	9.856 9154	3111.1	4.64	12.23	1 25.0
18	11	5	36.68	+ 0.134	1 36 53.5	25.38	9.849 5199	3048.5	4.72	12.44	1 21.2
19	11	5	30.36	- 0.664	1 28 5.7	18.53	9.842 3002	2964.0	4.80	12.65	1 17.2
20	11	5	4.65	1.481	1 22 7.5	11.25	9.835 3126	2854.6	4.88	12.86	1 12.8
21	11	4	19.20	- 2.308	+1 19 8.7	- 3.58	9.828 6205	-2717.1	4.95	13.06	1 8.1
22	11	3	13.87	3.136	1 19 18.4	+ 4.45	9.822 2955	2548.2	5.03	13.25	1 3.1
23	11	1	48.74	3.956	1 22 44.4	12.77	9.816 4169	2344.7	5.10	13.43	0 57.7
24	11	0	4.17	4.754	1 29 32.9	21.30	9.811 0708	2104.1	5.16	13.59	0 52.0
25	10	58	0.88	5.512	1 39 47.8	29.94	9.806 3491	1833.8	5.22	13.74	0 46.1
26	10	55	40.02	- 6.215	+1 53 29.7	+ 38.54	9.802 3493	-1502.5	5.26	13.87	0 39.8
27	10	53	3.14	6.843	2 10 36.0	46.93	9.799 1698	1140.2	5.30	13.97	0 33.3
28	10	50	12.32	7.374	2 30 59.4	54.94	9.796 9086	737.6	5.33	14.05	0 26.5
29	10	47	10.11	7.789	2 54 28.4	62.36	9.795 6595	- 207.5	5.35	14.09	0 19.5
30	10	43	59.57	8.065	3 20 46.3	68.97	9.795 5078	+ 175.9	5.35	14.09	0 12.5
31	10	40	44.23	- 8.186	+3 49 30.9	+ 74.56	9.796 5253	+ 676.0	5.33	14.06	0 5.3
pt. 1	10	37	27.99	8.138	4 20 15.8	78.96	9.798 7680	1195.3	5.31	13.98	23 51.0
2	10	34	15.05	7.910	4 52 30.1	81.99	9.802 2704	1724.2	5.27	13.87	23 44.0
3	10	31	9.79	7.498	5 25 39.5	83.54	9.807 0439	2252.7	5.21	13.72	23 37.2
4	10	28	16.62	6.903	5 59 7.5	83.54	9.813 0745	2770.1	5.13	13.53	23 30.7
5	10	25	39.84	- 6.134	+6 32 16.8	+ 81.97	9.820 3231	+3266.0	5.05	13.31	23 24.5
6	10	23	23.49	5.203	7 4 30.1	78.89	9.828 7262	3730.7	4.95	13.05	23 18.7
7	10	21	31.24	4.129	7 35 11.9	74.36	9.838 1987	4155.7	4.84	12.77	23 13.3
8	10	20	6.28	2.933	8 3 49.0	68.52	9.848 6362	4534.0	4.73	12.47	23 8.5
9	10	19	11.21	1.641	8 29 51.7	61.52	9.859 9208	4860.6	4.61	12.15	23 4.1
10	10	18	48.06	- 0.279	+8 52 53.9	+ 53.51	9.871 9232	+5131.9	4.49	11.82	23 0.4
11	10	18	58.20	+ 1.129	9 12 33.7	44.68	9.884 5086	5346.4	4.36	11.48	22 57.1
12	10	19	42.40	2.555	9 28 33.4	35.20	9.897 5403	5503.9	4.23	11.14	22 54.5
13	10	21	0.81	3.976	9 40 39.3	25.23	9.910 8825	5605.5	4.10	10.80	22 52.4
14	10	22	53.02	5.369	9 48 41.7	14.93	9.924 4040	5653.6	3.98	10.47	22 50.8
15	10	25	18.14	+ 6.714	+9 52 34.7	+ 4.47	9.937 9798	+5651.6	3.86	10.15	22 49.8
16	10	28	14.79	7.994	9 52 16.1	- 6.02	9.951 4945	5603.2	3.74	9.84	22 49.3
17	10	31	41.24	9.196	9 47 46.6	16.41	9.964 8420	5513.2	3.62	9.54	22 49.2
18	10	35	35.47	10.307	9 39 10.4	26.56	9.977 9283	5386.3	3.51	9.26	22 49.6
19	10	39	55.19	11.319	9 26 34.3	36.38	9.990 6711	5227.0	3.41	8.99	22 50.3
20	10	44	37.97	+12.228	+9 10 7.6	- 45.76	0.003 0011	+5043.1	3.32	8.74	22 51.4
21	10	49	41.28	13.031	8 50 1.9	54.62	0.014 8611	4837.2	3.23	8.50	22 52.8
22	10	55	2.60	13.729	8 26 30.5	62.90	0.026 2072	4615.6	3.14	8.28	22 54.5
23	11	0	39.43	14.324	7 59 48.0	70.53	0.037 0071	4382.9	3.07	8.08	22 56.4
24	11	6	29.39	14.823	7 30 10.3	77.50	0.047 2396	4143.5	3.00	7.89	22 58.4
25	11	12	30.23	+15.232	+6 57 53.5	- 83.78	0.056 8938	+3901.5	2.93	7.72	23 0.7
26	11	18	39.90	15.560	6 23 14.1	89.39	0.065 9672	3660.1	2.87	7.56	23 3.0
27	11	24	56.53	15.814	5 46 28.3	94.32	0.074 4652	3422.3	2.81	7.41	23 5.4
28	11	31	18.47	16.004	5 7 52.0	98.60	0.082 3988	3190.2	2.76	7.28	23 7.9
29	11	37	44.28	16.138	4 27 40.2	102.28	0.089 7841	2965.6	2.72	7.15	23 10.4
30	11	44	12.72	+16.225	+3 46 7.3	-105.38	0.096 6405	+2749.7	2.68	7.04	23 13.0
ct. 1	11	50	42.76	+16.272	+3 3 26.3	-107.95	0.102 9903	+2543.4	2.64	6.94	23 15.6

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	M
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
Oct. 1	h m s	s	° ' "	"			"	"	
1	11 50 42.76	+16.272	+ 8 3 26.3	-107.95	0.102 9903	+2543.4	2.64	6.94	2
2	11 57 13.54	16.287	2 19 49.5	110.03	0.108 8566	2346.9	2.60	6.85	2
3	12 3 44.35	16.276	1 35 28.2	111.67	0.114 2636	2160.6	2.57	6.77	2
4	12 10 14.65	16.245	0 50 32.3	112.92	0.119 2356	1984.4	2.54	6.69	2
5	12 16 43.99	16.198	+ 0 5 11.0	113.80	0.123 7963	1817.8	2.51	6.62	2
6	12 23 12.05	+16.139	- 0 40 27.5	-114.36	0.127 9688	+1600.8	2.49	6.55	2
7	12 29 38.60	16.072	1 26 15.9	114.63	0.131 7753	1512.7	2.47	6.49	2
8	12 36 3.49	16.001	2 12 7.7	114.65	0.135 2365	1373.1	2.45	6.44	2
9	12 42 26.62	15.926	2 57 57.2	114.44	0.138 3722	1241.2	2.43	6.40	2
10	12 48 47.94	15.851	3 43 39.1	114.02	0.141 2001	1116.7	2.41	6.36	2
11	12 55 7.47	+15.777	- 4 29 8.9	-113.43	0.143 7377	+ 990.0	2.40	6.32	2
12	13 1 25.24	15.705	5 14 22.6	112.68	0.146 0001	887.4	2.39	6.29	2
13	13 7 41.31	15.636	5 59 16.4	111.78	0.148 0017	781.5	2.37	6.26	2
14	13 13 55.78	15.571	6 43 47.2	110.76	0.149 7555	690.8	2.36	6.23	2
15	13 20 8.75	15.511	7 27 52.1	109.62	0.151 2731	584.6	2.35	6.21	2
16	13 26 20.33	+15.455	- 8 11 28.4	-108.39	0.152 5651	+ 492.8	2.35	6.19	2
17	13 32 30.65	15.406	8 54 33.9	107.05	0.153 6415	404.8	2.34	6.17	2
18	13 38 39.85	15.362	9 37 6.3	105.64	0.154 5106	320.0	2.34	6.16	2
19	13 44 48.06	15.324	10 19 3.8	104.14	0.155 1797	238.2	2.34	6.16	2
20	13 50 55.43	15.291	11 0 24.5	102.57	0.155 6559	159.0	2.34	6.15	.
21	13 57 2.08	+15.264	-11 41 6.7	-100.94	0.155 9448	+ 82.1	2.33	6.14	
22	14 3 8.17	15.244	12 21 9.0	99.24	0.156 0513	+ 7.0	2.33	6.14	
23	14 9 13.84	15.229	13 0 29.7	97.48	0.155 9797	- 66.4	2.33	6.14	
24	14 15 19.19	15.219	13 39 7.6	95.66	0.155 7337	138.5	2.34	6.15	
25	14 21 24.37	15.214	14 17 1.2	93.79	0.155 3159	209.5	2.34	6.15	
26	14 27 29.49	+15.214	-14 54 9.3	- 91.87	0.154 7286	- 279.8	2.34	6.16	
27	14 33 34.66	15.218	15 30 30.5	89.89	0.153 9732	349.5	2.34	6.17	
28	14 39 39.99	15.226	16 6 3.6	87.86	0.153 0510	419.0	2.35	6.19	
29	14 45 45.56	15.239	16 40 47.3	85.77	0.151 9622	488.4	2.35	6.20	
30	14 51 51.47	15.254	17 14 40.4	83.64	0.150 7068	557.8	2.36	6.22	
31	14 57 57.78	+15.272	-17 47 41.6	- 81.45	0.149 2845	- 637.6	2.36	6.24	
Nov. 1	15 4 4.55	15.292	18 19 49.7	79.21	0.147 6937	698.1	2.37	6.26	
2	15 10 11.84	15.315	18 51 3.4	76.92	0.145 9331	769.3	2.38	6.29	
3	15 16 19.69	15.339	19 21 21.5	74.57	0.144 0004	841.5	2.40	6.32	
4	15 22 28.11	15.363	19 50 42.6	72.17	0.141 8930	915.0	2.41	6.35	
5	15 28 37.10	+15.386	-20 19 5.4	- 69.72	0.139 6074	- 989.9	2.42	6.38	
6	15 34 46.66	15.410	20 46 28.6	67.50	0.137 1400	1066.5	2.43	6.42	
7	15 40 56.76	15.431	21 12 50.7	64.63	0.134 4868	1144.9	2.45	6.46	
8	15 47 7.34	15.450	21 38 10.5	62.00	0.131 6428	1225.5	2.46	6.50	
9	15 53 18.31	15.465	22 2 26.4	59.31	0.128 6025	1308.4	2.48	6.54	
10	15 59 29.60	+15.475	-22 25 37.0	- 56.56	0.125 3602	-1394.0	2.50	6.59	
11	16 5 41.05	15.479	22 47 41.0	53.75	0.121 9092	1482.4	2.52	6.64	
12	16 11 52.53	15.476	23 8 36.6	50.88	0.118 2424	1573.8	2.54	6.70	
13	16 18 3.82	15.463	23 28 22.6	47.94	0.114 3520	1668.8	2.56	6.76	
14	16 24 14.69	15.441	23 46 57.3	44.94	0.110 2293	1767.3	2.59	6.83	
15	16 30 24.88	+15.406	-24 4 19.3	- 41.88	0.106 8656	-1869.8	2.62	6.90	
16	16 36 34.07	+15.357	-24 20 26.9	- 38.75	0.101 2507	-1976.6	2.65	6.97	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h m s	° ' "	"		° ' "	"							
Nov. 16	16 36 34.07	+15.357	-24 20 26.9	-38.75	0.101 2507	-1976.6	2.65	6.97	0 57.7				
17	16 42 41.87	15.200	24 35 18.9	35.56	0.096 3741	2088.0	2.68	7.05	0 59.9				
18	16 48 47.86	15.205	24 48 53.5	32.31	0.091 2247	2204.0	2.71	7.13	1 2.0				
19	16 54 51.55	15.097	25 1 9.5	29.01	0.085 7905	2325.5	2.75	7.22	1 4.1				
20	17 0 52.34	14.964	25 12 5.4	25.64	0.080 0582	2452.3	2.78	7.32	1 6.2				
21	17 6 49.60	+14.802	-25 21 39.9	-22.22	0.074 0151	-2584.7	2.82	7.42	1 8.2				
22	17 12 42.57	14.606	25 29 51.7	18.75	0.067 6468	2723.1	2.86	7.53	1 10.2				
23	17 18 30.37	14.371	25 36 39.7	15.24	0.060 9392	2867.6	2.90	7.65	1 12.0				
24	17 24 12.04	14.093	25 42 2.9	11.69	0.053 8775	3018.2	2.95	7.78	1 13.8				
25	17 29 46.44	13.765	25 46 0.5	8.11	0.046 4470	3174.9	3.00	7.91	1 15.4				
26	17 35 12.30	+13.380	-25 48 32.0	-4.51	0.038 6333	-3337.4	3.05	8.05	1 16.9				
27	17 40 28.17	12.931	25 49 36.8	-0.89	0.030 4231	3506.3	3.11	8.20	1 18.2				
28	17 45 32.43	12.411	25 49 14.8	+2.72	0.021 8041	3677.8	3.17	8.36	1 19.3				
29	17 50 23.22	11.807	25 47 26.4	6.31	0.012 7668	3853.8	3.24	8.54	1 20.2				
30	17 54 58.45	11.112	25 44 12.0	9.88	0.003 3043	4031.7	3.31	8.73	1 20.8				
ec. 1	17 59 15.79	+10.315	-25 39 32.5	+13.40	9.993 4149	-4209.1	3.39	8.93	1 21.1				
2	18 3 12.67	9.404	25 33 29.2	16.86	9.983 1031	4383.2	3.47	9.15	1 21.1				
3	18 6 46.20	8.368	25 26 3.9	20.24	9.972 3817	4549.5	3.56	9.38	1 20.7				
4	18 9 53.27	7.197	25 17 18.5	23.52	9.961 2758	4702.9	3.65	9.62	1 19.9				
5	18 12 30.49	5.880	25 7 15.7	26.70	9.949 8231	4837.1	3.75	9.88	1 18.5				
6	18 14 34.32	+4.413	-24 55 58.0	+29.76	9.938 0799	-4943.4	3.85	10.15	1 16.6				
7	18 16 1.07	2.792	24 43 28.4	32.69	9.926 1252	5011.8	3.96	10.43	1 14.1				
8	18 16 47.14	+1.023	24 29 50.0	35.49	9.914 0629	5080.8	4.07	10.73	1 10.9				
9	18 16 49.11	-0.879	24 15 5.8	38.17	9.902 0275	4987.1	4.18	11.03	1 6.9				
10	18 16 4.09	2.887	23 59 19.0	40.71	9.890 1862	4866.7	4.29	11.33	1 2.2				
11	18 14 30.01	-4.959	-23 42 32.7	+43.12	9.878 7398	-4655.6	4.41	11.63	0 56.7				
12	18 12 6.04	7.033	23 24 50.7	45.35	9.867 9216	4341.6	4.52	11.92	0 50.4				
13	18 8 52.99	9.035	23 6 17.7	47.35	9.857 9895	3916.0	4.63	12.20	0 43.2				
14	18 4 53.67	10.873	22 47 0.4	49.02	9.849 2163	3376.1	4.72	12.45	0 35.3				
15	18 0 13.19	12.449	22 27 8.4	50.21	9.841 8716	2737.4	4.80	12.66	0 26.7				
16	17 54 58.99	-13.669	-22 6 55.6	+50.72	9.836 2000	-1985.0	4.86	12.83	0 17.6				
17	17 49 20.57	14.456	21 46 40.7	50.35	9.832 3993	1173.2	4.91	12.94	0 8.1				
18	17 43 29.00	14.759	21 26 47.1	48.92	9.830 5989	-323.8	4.93	12.99	23 48.6				
19	17 37 36.13	14.565	21 7 42.0	46.29	9.830 8458	+526.5	4.93	12.99	23 39.0				
20	17 31 53.65	13.900	20 49 54.8	42.45	9.833 0982	1341.9	4.91	12.92	23 29.8				
21	17 26 32.23	-12.822	-20 33 53.4	+37.49	9.837 2342	+2091.5	4.86	12.80	23 21.0				
22	17 21 40.87	11.412	20 20 2.8	31.60	9.843 0652	2751.1	4.80	12.63	23 12.8				
23	17 17 26.42	9.761	20 8 41.9	25.06	9.850 3560	3306.6	4.72	12.42	23 5.4				
24	17 13 53.53	7.962	20 0 2.8	18.17	9.858 8496	3753.3	4.63	12.18	22 58.6				
25	17 11 4.75	6.097	19 54 10.2	11.23	9.868 2864	4093.4	4.53	11.92	22 52.6				
26	17 9 0.84	-4.233	-19 51 2.3	+4.49	9.878 4192	+4335.1	4.42	11.64	22 47.3				
27	17 7 41.14	2.420	19 50 31.5	-1.84	9.889 0255	4489.9	4.31	11.36	22 42.7				
28	17 7 3.96	-0.694	19 52 26.0	7.61	9.899 9115	4570.6	4.20	11.08	22 38.8				
29	17 7 6.93	+0.922	19 56 31.4	12.72	9.910 9155	4590.3	4.10	10.80	22 35.5				
30	17 7 47.27	2.419	20 2 31.2	17.15	9.921 9057	4561.0	4.00	10.53	22 32.8				
31	17 9 2.02	+8.790	-20 10 8.8	-20.86	9.932 7779	+4493.7	3.90	10.27	22 30.8				
32	17 10 48.22	...	-20 19 7.3	...	9.943 4525	...	3.81	10.02	22 28.9				

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	" ' "	" "	" ' "	" "		
Jan.	1	90 27 26.4	6 16 30.5	+12 50.8	+4 47 51.6	+33 32.1	9.490 2046	+20422
	2	96 42 14.8	6 12 52.2	12 43.0	5 19 27.0	29 35.0	9.492 6667	28732
	3	102 52 43.6	6 7 52.6	11 59.9	5 46 55.5	25 19.5	9.495 9309	36439
	4	108 57 35.7	6 1 40.4	10 44.9	6 10 2.4	20 53.2	9.499 9302	43416
	5	114 55 43.5	5 54 25.5	9 3.3	6 28 41.0	16 24.0	9.504 5869	49578
	6	120 46 9.6	5 46 19.2	+ 7 1.3	+6 42 51.8	+11 58.8	9.509 8169	+54874
	7	126 28 8.7	5 37 33.3	4 45.6	6 52 41.9	7 43.3	9.515 5324	59290
	8	132 1 6.8	5 28 18.9	+ 2 22.6	6 58 23.2	+ 3 42.0	9.521 6461	62840
	9	137 24 40.7	5 18 46.9	- 0 1.4	7 0 11.6	- 0 2.1	9.528 0728	65560
	10	142 38 37.9	5 9 6.9	2 21.1	6 58 25.5	3 26.7	9.534 7324	67508
	11	147 42 54.6	4 59 27.2	- 4 32.2	+6 53 24.9	- 6 31.1	9.541 5508	+68746
	12	152 37 34.8	4 49 55.0	6 31.1	6 45 30.2	9 14.9	9.548 4603	69343
	13	157 22 48.9	4 40 35.8	8 15.4	6 35 1.8	11 38.7	9.555 4007	69378
	14	161 58 52.2	4 31 34.1	9 43.6	6 22 19.1	13 43.6	9.562 3196	68922
	15	166 26 4.1	4 22 53.3	10 54.7	6 7 40.5	15 30.9	9.569 1709	68039
	16	170 44 46.6	4 14 35.7	-11 48.7	+5 51 22.8	-17 1.8	9.575 9154	+66795
	17	174 55 23.8	4 6 42.9	12 25.7	5 33 41.7	18 18.1	9.582 5198	63248
	18	178 58 20.9	3 59 15.6	12 46.6	5 14 50.9	19 21.3	9.588 9566	63448
	19	182 54 3.7	3 52 14.3	12 52.2	4 55 3.0	20 12.8	9.595 2025	61439
	20	186 42 58.1	3 45 38.8	12 43.8	4 34 28.8	20 53.9	9.601 2388	59262
	21	190 25 29.8	3 39 28.8	-12 22.7	+4 13 18.2	-21 26.0	9.607 0503	+56948
	22	194 2 4.0	3 33 43.7	11 50.1	3 51 39.4	21 50.3	9.612 6249	54527
	23	197 33 5.2	3 28 22.6	11 7.5	3 29 39.9	22 7.6	9.617 9530	52022
	24	200 58 56.9	3 23 24.6	10 16.2	3 7 26.1	22 19.1	9.623 0273	49455
	25	204 20 1.9	3 18 49.1	9 17.5	2 45 3.4	22 25.6	9.627 8424	46839
	26	207 36 42.1	3 14 34.8	- 8 12.6	+2 22 36.5	-22 27.5	9.632 3941	+44192
	27	210 49 18.2	3 10 40.9	7 2.8	2 0 9.7	22 25.6	9.636 6801	41325
	28	213 58 10.3	3 7 6.5	5 49.2	1 37 46.4	22 20.5	9.640 6986	38843
	29	217 3 37.3	3 3 50.6	4 32.7	1 15 29.7	22 12.6	9.644 4485	36155
	30	220 5 57.5	3 0 52.6	3 14.4	0 53 22.1	22 2.2	9.647 9296	33468
	31	223 5 28.2	2 58 11.6	- 1 55.1	+0 31 26.1	-21 49.5	9.651 1422	+30783
Feb.	1	226 2 26.1	2 55 46.8	- 0 35.7	+0 9 43.6	21 35.2	9.654 0864	28104
	2	228 57 7.0	2 53 37.6	+ 0 43.0	-0 11 43.8	21 19.2	9.656 7633	25435
	3	231 49 46.3	2 51 43.4	2 0.4	0 32 54.3	21 1.7	9.659 1736	22773
	4	234 40 38.7	2 50 3.7	3 15.8	0 53 46.7	20 42.9	9.661 3183	20122
	5	237 29 58.4	2 48 38.0	+ 4 28.6	-1 14 19.7	-20 22.9	9.663 1984	+17483
	6	240 17 59.3	2 47 25.9	5 38.2	1 34 32.2	20 1.8	9.664 8151	14852
	7	243 4 54.6	2 46 27.0	6 44.2	1 54 23.0	19 39.6	9.666 1690	12228
	8	245 50 57.5	2 45 40.9	7 45.9	2 13 51.0	19 16.4	9.667 2611	9615
	9	248 36 20.6	2 45 7.5	8 43.1	2 32 55.4	18 52.1	9.668 0921	7006
	10	251 21 16.6	2 44 46.6	+ 9 35.3	-2 51 34.9	-18 26.7	9.668 6624	+ 4402
	11	254 5 57.9	2 44 38.0	10 22.0	3 9 48.5	18 0.4	9.668 9726	+ 1801
	12	256 50 36.7	2 44 41.7	11 3.0	3 27 35.2	17 32.9	9.669 0226	- 800
	13	259 35 25.3	2 44 57.5	11 38.0	3 44 53.8	17 4.1	9.668 8127	3400
	14	262 20 35.8	2 45 25.5	12 6.5	4 1 42.9	16 34.0	9.668 3426	6002
	15	265 6 20.4	2 46 5.8	+12 28.4	-4 18 1.4	-16 2.6	9.667 6122	- 8608
	16	267 52 51.6	2 46 58.6	+12 43.4	-4 33 47.6	-15 29.6	9.666 6207	-11221

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	" ' "	" ' "	" "	" ' "	" "		
ib. 16	267 52 51.6	2 46 58.6	+12 43.4	-4 33 47.6	-15 29.6	9.666 6207	-11221
17	270 40 21.7	2 48 3.9	12 51.2	4 49 0.0	14 55.0	9.665 3677	13841
18	273 29 3.6	2 49 22.0	12 51.6	5 3 36.9	14 18.5	9.663 8523	16468
19	276 19 10.0	2 50 53.1	12 44.6	5 17 36.3	13 40.0	9.662 0738	19103
20	279 10 54.2	2 52 37.6	12 29.9	5 30 56.1	12 59.2	9.660 0311	21752
21	282 4 29.7	2 54 35.8	+12 7.4	-5 43 33.9	-12 15.9	9.657 7231	-24409
22	285 0 10.5	2 56 48.2	11 37.2	5 55 27.1	11 30.0	9.655 1491	27073
23	287 58 11.0	2 59 15.2	10 59.2	6 6 32.9	10 41.1	9.652 3081	29749
24	290 58 46.0	3 1 57.4	10 13.5	6 16 48.1	9 48.8	9.649 1991	32432
25	294 2 11.0	3 4 55.3	9 20.2	6 26 9.2	8 52.9	9.645 8215	35120
26	297 8 42.0	3 8 9.4	+ 8 19.5	-6 34 32.5	- 7 52.9	9.642 1751	-37808
27	300 18 35.5	3 11 40.5	7 11.7	6 41 53.6	6 48.6	9.638 2600	40492
28	303 32 8.9	3 15 29.3	5 57.2	6 48 8.1	5 39.5	9.634 0769	43168
r. 1	306 49 40.1	3 19 36.3	4 36.6	6 53 10.8	4 25.1	9.629 6270	45824
2	310 11 27.8	3 24 2.4	3 10.6	6 56 56.4	3 5.0	9.624 9130	48452
3	313 37 51.4	3 28 48.2	+ 1 39.9	-6 59 18.7	- 1 38.6	9.619 9380	-51039
4	317 9 11.0	3 33 54.4	+ 0 5.6	7 0 11.4	- 0 5.7	9.614 7071	53570
5	320 45 47.3	3 39 21.8	- 1 31.1	6 59 27.6	+ 1 34.5	9.609 2265	56026
6	324 28 1.8	3 45 10.9	3 8.9	6 56 59.8	3 22.3	9.603 5051	58385
7	328 16 16.4	3 51 22.0	4 46.1	6 52 40.3	5 18.1	9.597 5538	60619
8	332 10 53.3	3 57 55.6	- 6 20.7	-6 46 20.8	+ 7 22.3	9.591 3867	-62695
9	336 12 15.1	4 4 51.8	7 50.7	6 37 52.8	9 35.1	9.585 0212	64581
10	340 20 44.4	4 12 10.4	9 13.8	6 27 7.7	11 56.6	9.578 4783	66232
11	344 36 43.1	4 19 50.7	10 27.4	6 13 56.8	14 26.6	9.571 7842	67599
12	349 0 32.8	4 27 52.0	11 28.8	5 58 11.8	17 4.7	9.564 9698	68627
13	353 32 33.5	4 36 12.6	-12 15.2	-5 39 45.0	+19 50.1	9.558 0721	-69255
14	358 13 8.7	4 44 50.4	12 43.9	5 18 29.6	22 41.6	9.551 1342	69420
15	3 2 18.9	4 53 42.2	12 52.2	4 54 20.4	25 37.3	9.544 2061	69946
16	8 0 31.5	5 2 44.4	12 37.9	4 27 14.3	28 35.0	9.537 3454	68062
17	13 7 49.5	5 11 52.0	11 59.4	3 57 10.8	31 31.4	9.530 6164	66398
18	18 24 15.4	5 20 59.1	-10 55.7	-3 24 13.2	+34 22.7	9.524 0909	-63983
19	23 49 45.2	5 29 58.6	9 26.9	2 48 28.6	37 4.5	9.517 8468	60759
20	29 24 7.3	5 38 42.2	7 34.5	2 10 9.2	39 31.4	9.511 9677	56678
21	35 7 1.3	5 47 0.9	5 21.2	1 29 32.7	41 37.8	9.506 5405	51719
22	40 57 57.3	5 54 44.4	2 51.6	0 47 2.4	43 17.9	9.501 6530	45887
23	46 56 14.8	6 1 42.2	- 0 11.5	-0 3 7.7	+44 25.8	9.497 3911	-39217
24	53 1 2.9	6 7 43.8	+ 2 32.0	+0 41 36.8	44 56.8	9.493 8352	31780
25	59 11 20.1	6 12 38.7	5 10.9	1 26 32.1	44 46.6	9.491 0571	23685
26	65 25 55.0	6 16 18.0	7 36.9	2 10 55.4	43 52.8	9.489 1152	15082
27	71 43 28.3	6 18 34.1	9 41.9	2 54 3.1	42 15.3	9.488 0519	- 6144
28	78 2 33.7	6 19 21.7	+11 19.0	+3 35 11.8	+39 55.3	9.487 8911	+ 2934
29	84 21 41.4	6 18 38.5	12 23.2	4 13 40.8	36 56.7	9.488 6364	11944
30	90 39 20.5	6 16 24.8	12 51.1	4 48 54.2	33 25.1	9.490 2710	20688
31	96 54 1.8	6 12 43.7	12 42.2	5 20 22.2	29 27.3	9.492 7590	23981
r. 1	103 4 21.0	6 7 41.9	11 58.0	5 47 42.7	25 11.3	9.496 0469	36666
2	109 9 1.4	6 1 27.6	+10 42.1	+6 10 41.3	+20 44.8	9.500 0677	+43618
3	115 6 55.4	5 54 10.9	+ 8 59.8	+6 29 11.5	+16 15.7	9.504 7432	+49754

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.		Var. per Day.		Reduction to Orbit.		Heliocentric Latitude.		Var. per Day.		Logarithm of Radius Vector.
		" ' "	" ' "	" ' "	" ' "	" ' "	" ' "	" ' "	" ' "	" ' "	" ' "	
Apr.	1	103 4 21.0	6 7 41.9	+11 58.0	+5 47 42.7	+25 11.3	9.496 0469					
	2	109 9 1.4	6 1 27.6	10 42.1	6 10 41.3	20 44.8	9.500 0677					
	3	115 6 55.4	5 54 10.9	8 59.8	6 29 11.5	16 15.7	9.504 7432					
	4	120 57 6.2	5 46 3.2	6 57.3	6 43 14.1	11 50.7	9.509 9895					
	5	126 38 48.8	5 37 16.3	4 41.2	6 52 56.2	7 35.6	9.515 7184					
	6	132 11 29.5	5 28 1.3	+ 2 18.1	+6 58 30.0	+ 3 34.7	9.521 8430					
	7	137 34 45.6	5 18 28.8	- 0 5.8	7 0 11.4	- 0 8.7	9.528 2780					
	8	142 48 24.6	5 8 48.7	2 25.4	6 58 19.0	3 32.7	9.534 9435					
	9	147 52 23.3	4 59 9.3	4 36.1	6 53 12.7	6 36.5	9.541 7653					
	10	152 46 45.7	4 49 37.3	6 34.6	6 45 12.9	9 19.6	9.548 6764					
	11	157 31 42.3	4 40 18.6	- 8 18.4	+6 34 40.1	-11 42.8	9.555 6167					
	12	162 7 28.8	4 31 17.6	9 46.1	6 21 53.5	13 47.3	9.562 5338					
	13	166 34 24.5	4 22 37.5	10 56.7	6 7 11.5	15 34.0	9.569 3822					
	14	170 52 51.6	4 14 20.7	11 50.1	5 50 51.0	17 4.4	9.576 1227					
	15	175 3 14.1	4 6 28.6	12 26.6	5 33 7.5	18 20.3	9.582 7225					
	16	179 5 57.4	3 59 2.2	-12 47.0	+5 14 14.8	-19 23.0	9.589 1533					
	17	183 1 27.2	3 52 1.7	12 52.2	4 54 25.3	20 14.2	9.595 3929					
	18	186 50 9.4	3 45 27.0	12 43.4	4 33 49.8	20 55.0	9.601 4223					
	19	190 32 29.7	3 39 17.8	12 21.8	4 12 38.2	21 26.9	9.607 2264					
	20	194 8 53.3	3 33 33.4	11 48.9	3 50 58.6	21 51.0	9.612 7934					
	21	197 39 44.5	3 28 13.0	-11 6.0	+3 28 58.6	-22 8.1	9.618 1137					
	22	201 5 27.0	3 23 15.9	10 14.5	3 6 44.4	22 19.4	9.623 1799					
	23	204 26 23.6	3 18 40.9	9 15.6	2 44 21.5	22 25.6	9.627 9870					
	24	207 42 55.9	3 14 27.2	8 10.5	2 21 54.6	22 27.5	9.632 5306					
	25	210 55 24.9	3 10 34.0	7 0.6	1 59 27.8	22 25.5	9.636 8084					
	26	214 4 10.4	3 7 0.2	- 5 46.8	+1 37 4.6	-22 20.3	9.640 8184					
	27	217 9 31.4	3 3 44.9	4 30.3	1 14 48.1	22 12.3	9.644 5601					
	28	220 11 46.1	3 0 47.4	3 11.9	0 52 40.9	22 1.7	9.648 0328					
	29	223 11 11.9	2 58 6.9	1 52.6	0 30 45.3	21 49.1	9.651 2369					
	30	226 8 5.3	2 55 42.6	- 0 33.2	+0 9 3.2	21 34.8	9.654 1727					
May	1	229 2 42.3	2 53 33.9	+ 0 45.5	-0 12 23.7	-21 18.7	9.656 8412					
	2	231 55 18.1	2 51 40.2	2 2.8	0 33 33.7	21 1.1	9.659 2434					
	3	234 46 7.5	2 50 0.9	3 18.1	0 54 25.5	20 42.3	9.661 3798					
	4	237 35 24.6	2 48 35.6	4 30.8	1 14 57.9	20 22.3	9.663 2518					
	5	240 23 23.3	2 47 24.0	5 40.3	1 35 9.7	20 1.1	9.664 8603					
	6	243 10 16.9	2 46 25.4	+ 6 46.2	-1 54 59.8	-19 38.9	9.666 2062					
	7	245 56 18.4	2 45 39.7	7 47.8	2 14 27.2	19 15.6	9.667 2903					
	8	248 41 40.6	2 45 6.7	8 44.8	2 33 30.7	18 51.2	9.668 1132					
	9	251 26 36.0	2 44 46.2	9 36.8	2 52 9.4	18 26.0	9.668 6754					
	10	254 11 17.1	2 44 38.0	10 23.4	3 10 22.3	17 59.5	9.668 9775					
	11	256 55 56.0	2 44 42.0	+11 4.2	-3 28 8.1	-17 31.9	9.669 0197					
	12	259 40 45.1	2 44 58.2	11 39.0	3 45 25.8	17 3.2	9.668 8018					
	13	262 25 56.5	2 45 26.7	12 7.3	4 2 14.0	16 33.1	9.668 3238					
	14	265 11 42.5	2 46 7.3	12 29.0	4 18 31.5	16 1.6	9.667 5853					
	15	267 58 15.3	2 47 0.4	12 43.7	4 34 16.7	15 28.5	9.666 5859					
	16	270 45 47.5	2 48 6.1	+12 51.3	-4 49 28.0	-14 53.9	9.665 3248					
	17	273 34 31.8	2 49 24.6	+12 51.5	-5 4 3.8	-14 17.3	9.663 8015					

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	" ' "	" ' "	" ' "	" ' "	" ' "		
lay 17	273 34 31.8	2 49 24.6	+12 51.5	-5 4 3.8	-14 17.3	9.663 8015	-16548
18	276 24 41.1	2 50 56.1	12 44.2	5 18 1.9	13 38.6	9.662 0149	19185
19	279 16 28.5	2 52 41.0	12 29.3	5 31 20.4	12 57.9	9.659 9642	21830
20	282 10 7.7	2 54 39.7	12 6.6	5 43 56.9	12 14.6	9.657 6484	24488
21	285 5 52.6	2 56 52.5	11 36.1	5 55 48.7	11 28.5	9.655 0662	27156
22	288 3 57.6	2 59 20.0	+10 57.9	-6 6 52.9	-10 39.4	9.652 2169	-29831
23	291 4 37.7	3 2 2.7	10 11.9	6 17 6.5	9 47.1	9.649 0997	32513
24	294 8 8.2	3 5 1.0	9 18.4	6 26 25.9	8 51.0	9.645 7141	35201
25	297 14 45.1	3 8 15.6	8 17.4	6 34 47.2	7 51.0	9.642 0595	37890
26	300 24 45.1	3 11 47.3	7 9.4	6 42 6.4	6 46.6	9.638 1363	40572
27	303 38 25.5	3 15 26.5	+ 5 54.8	-6 48 18.7	- 5 37.2	9.633 9453	-43247
28	306 56 4.3	3 19 44.2	4 34.0	6 53 19.1	4 22.7	9.629 4875	45903
29	310 18 0.2	3 24 10.8	3 7.8	6 57 2.1	3 2.3	9.624 7657	48529
30	313 44 32.5	3 28 57.2	1 37.0	6 59 21.7	1 35.9	9.619 7830	51115
31	317 16 1.5	3 34 4.1	+ 0 2.6	7 0 11.6	- 0 2.7	9.614 5446	53643
ine 1	320 52 47.8	3 39 32.1	- 1 34.2	-6 59 24.6	+ 1 37.8	9.609 0568	-56098
2	324 35 13.0	3 45 21.8	3 12.0	6 56 53.5	3 25.8	9.603 3284	58452
3	328 23 38.8	3 51 33.6	4 49.1	6 52 30.4	5 21.9	9.597 3706	60681
4	332 18 27.7	3 58 7.9	6 23.6	6 46 7.0	7 26.3	9.591 1974	62753
5	336 20 2.1	4 5 4.7	7 53.4	6 37 34.9	9 39.4	9.584 8264	64632
6	340 28 44.6	4 12 24.0	- 9 16.3	-6 26 45.4	+12 1.1	9.578 2789	-66275
7	344 44 57.3	4 20 5.0	10 29.5	6 13 29.9	14 31.4	9.571 5809	67632
8	349 9 1.5	4 28 6.8	11 30.5	5 57 40.0	17 9.7	9.564 7638	68648
9	353 41 17.3	4 36 27.9	12 16.4	5 39 8.1	19 55.3	9.557 8646	69263
10	358 22 3.0	4 45 6.0	12 44.4	5 17 47.4	22 46.9	9.550 9267	69412
11	3 11 34.1	4 53 58.3	-12 52.1	-4 53 32.8	+25 42.8	9.544 0002	-69022
12	8 10 3.0	5 3 0.7	12 37.1	4 26 21.2	28 40.4	9.537 1428	68018
13	13 17 37.3	5 12 8.4	11 57.8	3 56 12.4	31 36.7	9.530 4193	66332
14	18 34 19.5	5 21 15.3	10 53.3	3 23 9.5	34 27.8	9.523 9015	63893
15	24 0 5.3	5 30 14.4	9 23.8	2 47 20.0	37 9.1	9.517 6677	60644
16	29 34 42.9	5 38 57.4	- 7 30.6	-2 8 56.2	+39 35.5	9.511 8012	-56538
17	35 17 51.6	5 47 15.0	5 16.8	1 28 15.9	41 41.2	9.506 3894	51553
18	41 9 1.1	5 54 57.3	2 46.8	0 45 42.7	43 20.4	9.501 5197	45696
19	47 7 30.8	6 1 53.6	- 0 6.5	-0 1 45.9	44 27.3	9.497 2781	39000
20	53 12 29.3	6 7 53.1	+ 2 37.0	+0 42 59.5	44 57.0	9.493 7451	31541
21	59 22 54.8	6 12 46.0	+ 5 15.6	+1 27 54.3	+44 45.5	9.490 9915	-23430
22	65 37 35.9	6 16 22.8	7 41.0	2 12 15.9	43 50.5	9.489 0758	14813
23	71 55 12.6	6 18 36.3	9 45.3	2 55 20.6	42 11.6	9.488 0396	- 5872
24	78 14 19.0	6 19 21.3	11 21.5	3 36 24.9	39 50.3	9.487 9060	+ 3205
25	84 33 24.8	6 18 35.2	12 24.6	4 14 48.4	36 50.6	9.488 6783	12210
26	90 50 59.3	6 16 18.8	+12 51.4	+4 49 55.2	+33 18.1	9.490 3390	+20643
27	97 5 33.4	6 12 35.4	12 41.4	5 21 16.0	29 19.7	9.492 8517	29219
28	103 15 43.1	6 7 31.2	11 56.1	5 48 28.6	25 3.2	9.496 1624	36883
29	109 20 11.7	6 1 14.8	10 39.4	6 11 19.1	20 36.7	9.500 2038	43813
30	115 17 52.1	5 53 56.6	8 56.4	6 29 41.1	16 7.5	9.504 8976	49922
dy 1	121 7 48.0	5 45 47.7	+ 6 53.3	+6 43 35.6	+11 42.8	9.510 1593	+55165
2	126 49 14.4	5 36 59.7	+ 4 36.9	+6 53 10.0	+ 7 28.0	9.515 9012	+59527

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.
		" " "	" " "	" "	" " "	" "	
July	1	121 7 48.0	5 45 47.7	+ 6 53.3	+6 43 35.6	+11 42.8	9.510 1593
	2	126 49 14.4	5 36 59.7	4 36.9	6 53 10.0	7 28.0	9.515 9012
	3	132 21 38.1	5 27 44.0	+ 2 13.7	6 58 36.4	+ 3 27.6	9.522 0359
	4	137 44 36.7	5 18 11.2	- 0 10.2	7 0 11.0	- 0 15.2	9.528 4786
	5	142 57 58.1	5 8 31.1	2 29.5	6 58 12.4	3 38.7	9.535 1494
	6	148 1 39.2	4 58 51.7	- 4 39.9	+6 53 0.5	- 6 41.7	9.541 9745
	7	152 55 44.2	4 49 20.1	6 38.0	6 44 55.9	9 24.3	9.548 8868
	8	157 40 24.0	4 40 2.1	8 21.3	6 34 18.6	11 47.0	9.555 8269
	9	162 15 54.2	4 31 1.6	9 48.5	6 21 28.3	13 50.7	9.562 7423
	10	166 42 34.2	4 22 22.1	10 58.5	6 6 43.0	15 36.9	9.569 5876
	11	171 0 46.3	4 14 6.1	-11 51.4	+5 50 19.8	-17 6.9	9.576 3240
	12	175 10 54.7	4 6 14.8	12 27.5	5 32 34.0	18 22.4	9.582 9185
	13	179 13 24.5	3 58 49.2	12 47.4	5 13 39.3	19 24.8	9.589 3440
	14	183 8 41.7	3 51 49.5	12 52.1	4 53 48.2	20 15.6	9.595 5773
	15	186 57 12.1	3 45 15.5	12 42.9	4 33 11.5	20 56.1	9.601 6001
	16	190 39 21.3	3 39 7.1	-12 21.0	+4 11 58.9	-21 27.7	9.607 3970
	17	194 15 34.6	3 33 23.4	11 47.8	3 50 18.6	21 51.6	9.612 9566
	18	197 46 16.2	3 28 3.8	11 4.6	3 28 18.0	22 8.5	9.618 2691
	19	201 11 49.9	3 23 7.4	10 12.8	3 6 3.5	22 19.7	9.623 3274
	20	204 32 38.3	3 18 33.1	9 13.7	2 43 40.3	22 25.9	9.628 1264
	21	207 49 3.1	3 14 20.0	- 8 8.5	+2 21 13.3	-22 27.5	9.632 6619
	22	211 1 25.1	3 10 27.4	6 58.4	1 58 46.6	22 25.4	9.636 9315
	23	214 10 4.3	3 6 54.2	5 44.5	1 36 23.6	22 20.1	9.640 9335
	24	217 15 19.6	3 3 39.4	4 27.9	1 14 7.3	22 12.0	9.644 6670
	25	220 17 29.0	3 0 42.4	3 9.5	0 52 0.4	22 1.4	9.648 1315
	26	223 16 50.1	2 58 2.5	- 1 50.2	+0 30 5.1	-21 48.8	9.651 3274
	27	226 13 39.3	2 55 38.6	- 0 30.8	+0 8 23.4	21 34.3	9.654 2553
	28	229 8 12.5	2 53 30.4	+ 0 47.9	-0 13 3.0	21 18.2	9.656 9158
	29	232 0 45.0	2 51 37.1	2 5.2	0 34 12.5	21 0.6	9.659 3099
	30	234 51 31.5	2 49 58.3	3 20.4	0 55 3.7	20 41.7	9.661 4383
	31	237 40 46.2	2 48 33.4	+ 4 33.0	-1 15 35.5	-20 21.7	9.663 3024
Aug.	1	240 28 42.8	2 47 22.0	5 42.4	1 35 46.7	20 0.5	9.664 9028
	2	243 15 34.7	2 46 24.0	6 48.1	1 55 36.1	19 38.2	9.666 2408
	3	246 1 35.0	2 45 38.7	7 49.6	2 15 2.8	19 14.9	9.667 3170
	4	248 46 56.3	2 45 6.0	8 46.5	2 34 5.6	18 50.6	9.668 1320
	5	251 31 51.2	2 44 45.8	+ 9 38.3	-2 52 43.6	-18 25.2	9.668 6864
	6	254 16 32.1	2 44 38.0	10 24.8	3 10 55.6	17 58.7	9.668 9808
	7	257 1 11.3	2 44 42.4	11 5.4	3 28 40.6	17 31.1	9.669 0152
	8	259 46 1.0	2 44 59.0	11 39.9	3 45 57.4	17 2.3	9.668 7894
	9	262 31 13.4	2 45 27.7	12 8.1	4 2 44.7	16 32.1	9.668 3035
	10	265 17 0.6	2 46 8.8	+12 29.5	-4 19 1.2	-16 0.6	9.667 5571
	11	268 3 35.2	2 47 2.4	12 44.0	4 34 45.4	15 27.5	9.666 5498
	12	270 51 9.5	2 48 8.4	12 51.4	4 49 55.7	14 52.8	9.665 2808
	13	273 39 56.3	2 49 27.3	12 51.4	5 4 30.3	14 16.1	9.663 7495
	14	276 30 8.4	2 50 59.2	12 43.9	5 18 27.2	13 37.5	9.661 9551
	15	279 21 59.1	2 52 44.5	+12 28.7	-5 31 44.5	-12 56.6	9.659 8964
	16	282 15 42.0	2 54 43.6	+12 5.8	-5 44 19.6	-12 13.2	9.657 5725

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.	
	"	"	"	"	"	"	"			
Aug.	16	282	15 42.0	2 54	43.6	+12 5.8	-5 44 19.6	-12 13.2	9.657 5725	-24569
	17	285	11 31.0	2 56	56.8	11 35.1	5 56 9.9	11 27.1	9.654 9823	27236
	18	288	9 40.6	2 59	24.8	10 56.6	6 7 12.7	10 37.9	9.652 1250	29912
	19	291	10 25.7	3 2	7.9	10 10.4	6 17 24.6	9 45.4	9.648 9997	32594
	20	294	14 1.6	3 5	6.7	9 16.6	6 26 42.3	8 49.3	9.645 6060	35281
	21	297	20 44.5	3 8	21.9	+ 8 15.4	-6 35 1.8	- 7 49.0	9.641 9434	-37970
	22	300	30 51.0	3 11	54.1	7 7.2	6 42 18.9	6 44.5	9.638 0121	40654
	23	303	44 38.5	3 15	43.8	5 52.4	6 48 29.1	5 35.0	9.633 8130	43328
	24	307	2 24.8	3 19	52.0	4 31.5	6 53 27.2	4 20.2	9.629 3472	45982
	25	310	24 28.9	3 24	19.3	3 5.1	6 57 7.7	2 59.8	9.624 6175	48608
	26	313	51 9.9	3 29	6.2	+ 1 34.2	-6 59 24.7	- 1 33.1	9.619 6270	-51193
	27	317	22 48.2	3 34	13.8	- 0 0.3	7 0 11.6	+ 0 0.3	9.614 3809	53718
	28	320	59 44.6	3 39	42.5	1 37.2	6 59 21.6	1 41.0	9.608 8858	56169
	29	324	42 20.4	3 45	32.7	3 15.0	6 56 47.1	3 29.3	9.603 1503	58522
	30	328	30 57.5	3 51	45.3	4 52.0	6 52 20.4	5 25.6	9.597 1857	60746
	31	332	25 58.4	3 58	20.2	- 6 26.4	-6 45 53.2	+ 7 30.3	9.591 0064	-62812
pt.	1	336	27 45.5	4 5	17.8	7 56.1	6 37 17.0	9 43.6	9.584 6297	64685
	2	340	36 41.4	4 12	37.7	9 18.7	6 26 23.1	12 5.6	9.578 0774	66319
	3	344	53 8.1	4 20	19.3	10 31.6	6 13 3.0	14 36.1	9.571 3755	67667
	4	349	17 26.9	4 28	21.7	11 32.1	5 57 8.2	17 14.7	9.564 5555	68673
	5	353	49 57.9	4 36	43.4	-12 17.5	-5 38 31.2	+20 0.5	9.557 6544	-69275
	6	358	30 59.3	4 45	22.0	12 45.0	5 17 5.3	22 52.3	9.550 7162	69408
	7	3	20 46.6	4 54	14.6	12 52.0	4 52 45.3	25 48.2	9.543 7909	69900
	8	8	19 31.9	5 3	17.2	12 36.3	4 25 28.3	28 45.8	9.536 9367	67976
	9	13	27 22.8	5 12	25.0	11 56.2	3 55 14.1	31 42.0	9.530 2185	66270
	10	18	44 21.6	5 21	31.8	-10 50.9	-3 22 6.0	+34 32.9	9.523 7080	-63907
	11	24	10 23.7	5 30	30.5	9 20.6	2 46 11.6	37 13.9	9.517 4843	60529
	12	29	45 17.1	5 39	12.8	7 26.8	2 7 43.3	39 39.7	9.511 6306	56399
	13	35	28 40.8	5 47	29.6	5 12.5	1 26 59.2	41 44.7	9.506 2339	51389
	14	41	20 4.3	5 55	10.6	2 42.0	0 44 22.9	43 22.9	9.501 3820	45505
	15	47	18 46.5	6 2	5.2	- 0 1.5	-0 0 24.2	+44 28.7	9.497 1609	-38784
	16	53	23 55.8	6 8	3.0	+ 2 42.0	+0 44 22.1	44 57.2	9.493 6506	31304
	17	59	34 30.1	6 12	53.6	5 20.3	1 29 16.5	44 44.4	9.490 9217	23176
	18	65	49 17.6	6 16	28.0	7 45.2	2 13 36.4	43 48.1	9.489 0321	14547
	19	72	6 58.3	6 18	38.9	9 48.7	2 56 38.0	42 7.9	9.488 0231	- 5596
	20	78	26 5.8	6 19	21.1	+11 24.0	+3 37 38.0	+39 45.3	9.487 9171	+ 3481
	21	84	45 10.2	6 18	32.4	12 25.9	4 15 55.9	36 44.6	9.488 7167	12481
	22	91	2 40.4	6 16	13.2	12 51.6	4 50 56.3	33 11.2	9.490 4040	21200
	23	97	17 7.6	6 12	27.2	12 40.5	5 22 9.7	29 12.1	9.492 9417	29460
	24	103	27 7.9	6 7	20.7	11 54.2	5 49 14.5	24 55.2	9.496 2755	37104
	25	109	31 25.0	6 1	2.4	+10 36.6	+6 11 56.8	+20 28.4	9.500 3379	+44010
	26	115	28 52.1	5 53	42.4	8 52.9	6 30 10.6	15 59.3	9.505 0500	50092
	27	121	18 33.0	5 45	32.0	6 49.3	6 43 57.0	11 34.8	9.510 3275	55310
	28	126	59 43.3	5 36	43.1	4 32.6	6 53 23.6	7 20.4	9.516 0825	59645
	29	132	31 50.1	5 27	26.8	+ 2 9.3	6 58 42.7	+ 3 20.5	9.522 2277	63117
	30	137	54 31.3	5 17	53.7	- 0 14.5	+7 0 10.5	- 0 21.7	9.528 6784	+65764
Oct.	1	143	7 35.1	5 8	13.5	- 2 33.6	+6 58 5.7	- 3 44.5	9.535 3543	+67888

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	V
	° ' "	" ' "	" "	° ' "	" "		
Oct. 1	143 7 35.1	5 8 13.5	- 2 33.6	+6 58 5.7	- 3 44.5	9.535 3549	+
2	148 10 58.6	4 58 34.3	4 43.7	6 52 48.2	6 47.0	9.542 1837	
3	153 4 46.3	4 49 3.0	6 41.4	6 44 38.5	9 29.0	9.549 0976	
4	157 49 9.2	4 39 45.3	8 24.3	6 33 56.9	11 51.1	9.556 0376	
5	162 24 22.9	4 30 45.5	9 50.9	6 21 2.7	13 54.2	9.562 9515	
6	166 50 47.2	4 22 6.8	-11 0.4	+6 6 14.3	-15 39.9	9.569 7941	+
7	171 8 44.3	4 13 51.5	11 52.8	5 49 48.3	17 9.5	9.576 5267	
8	175 18 38.4	4 6 0.9	12 28.3	5 32 0.1	18 24.6	9.583 1166	
9	179 20 54.7	3 58 36.0	12 47.7	5 13 3.5	19 26.5	9.589 5364	
10	183 15 59.1	3 51 37.2	12 52.0	4 53 10.9	20 17.0	9.595 7634	
11	187 4 17.6	3 45 4.0	-12 42.4	+4 32 32.9	-20 57.3	9.601 7795	+
12	190 46 15.6	3 38 56.3	12 20.1	4 11 19.3	21 28.6	9.607 5695	
13	194 22 18.5	3 33 13.4	11 46.6	3 49 38.3	21 52.2	9.613 1217	
14	197 52 50.4	3 27 54.4	11 3.1	3 27 37.2	22 9.0	9.618 4267	
15	201 18 15.1	3 22 58.7	10 11.1	3 5 22.2	22 20.0	9.623 4772	
16	204 38 55.1	3 18 25.0	- 9 11.7	+2 42 58.9	-22 25.9	9.628 2682	+
17	207 55 12.2	3 14 12.7	8 6.4	2 20 31.9	22 27.5	9.632 7958	
18	211 7 27.2	3 10 20.6	6 56.1	1 58 5.2	22 25.4	9.637 0574	
19	214 15 59.8	3 6 47.9	5 42.2	1 35 42.3	22 19.9	9.641 0511	
20	217 21 9.2	3 3 33.8	4 25.5	1 13 26.3	22 11.7	9.644 7764	
21	220 23 13.2	3 0 37.3	- 3 7.0	+0 51 19.7	-22 1.1	9.648 2330	+
22	223 22 29.4	2 57 57.8	1 47.7	0 29 24.8	21 48.4	9.651 4208	
23	226 19 14.2	2 55 34.5	- 0 28.4	+0 7 43.5	21 33.8	9.654 3404	
24	229 13 43.5	2 53 26.6	+ 0 50.3	-0 13 42.3	21 17.6	9.656 9928	
25	232 6 12.5	2 51 33.8	2 7.5	0 34 51.3	21 0.1	9.659 3787	
26	234 56 56.0	2 49 55.5	+ 3 22.7	-0 55 42.0	-20 41.1	9.661 4992	+
27	237 46 8.1	2 48 31.0	4 35.2	1 16 13.2	20 21.0	9.663 3552	
28	240 34 2.5	2 47 20.0	5 44.5	1 36 23.7	19 59.8	9.664 9478	
29	243 20 52.6	2 46 22.4	6 50.1	1 56 12.4	19 37.5	9.666 2777	
30	246 6 51.5	2 45 37.4	7 51.4	2 15 38.4	19 14.2	9.667 3459	
31	248 52 11.7	2 45 5.2	+ 8 48.2	-2 34 40.4	-18 49.8	9.668 1530	+
Nov. 1	251 37 6.0	2 44 45.5	9 39.9	2 53 17.6	18 24.4	9.668 6995	
2	254 21 46.7	2 44 38.0	10 26.1	3 11 28.8	17 57.9	9.668 9858	+
3	257 6 26.0	2 44 42.7	11 6.6	3 29 13.0	17 30.3	9.669 0123	-
4	259 51 16.1	2 44 59.6	11 40.9	3 46 28.9	17 1.3	9.668 7787	
5	262 36 29.3	2 45 28.9	+12 8.8	-4 3 15.2	-16 31.1	9.668 2848	-
6	265 22 17.9	2 46 10.3	12 30.1	4 19 30.7	15 59.6	9.667 5305	
7	268 8 54.0	2 47 4.1	12 44.4	4 35 13.9	15 26.5	9.666 5152	
8	270 56 30.3	2 48 10.6	12 51.5	4 50 23.1	14 51.7	9.665 2384	
9	273 45 19.4	2 49 29.8	12 51.3	5 4 56.6	14 15.0	9.663 6991	
10	276 35 34.3	2 51 2.2	+12 43.5	-5 18 52.4	-13 36.3	9.661 8963	-
11	279 27 28.2	2 52 47.9	12 28.1	5 32 8.4	12 55.3	9.659 8295	
12	282 21 14.7	2 54 47.4	12 5.0	5 44 42.1	12 11.8	9.657 4973	
13	285 17 7.8	2 57 1.2	11 34.0	5 56 31.1	11 25.6	9.654 8990	
14	288 15 21.9	2 59 29.5	10 55.3	6 7 32.3	10 36.3	9.652 0835	
15	291 16 11.9	3 2 13.1	+10 8.8	-6 17 42.6	- 9 43.7	9.648 9000	-
16	294 19 53.3	3 5 12.4	+ 9 14.8	-6 26 58.5	- 8 47.5	9.645 4979	-

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.		Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ' "	° ' "	" " "	" " "	° ' "	" " "		
ov.	16	294 19 53.3	3 5 12.4	+ 9 14.8	-6 26 58.5	- 8 47.5	9.645 4979	-35363
	17	297 26 42.1	3 8 28.1	8 13.5	6 35 16.2	7 47.1	9.641 8272	38053
	18	300 36 55.1	3 12 0.8	7 5.0	6 42 31.3	6 42.4	9.637 8875	40737
	19	303 50 49.5	3 15 51.1	5 50.0	6 48 39.4	5 32.9	9.633 6802	43410
	20	307 8 43.5	3 19 59.9	4 28.9	6 53 35.2	4 17.9	9.629 2061	46065
	21	310 30 55.7	3 24 27.7	+ 3 2.4	-6 57 13.2	- 2 57.2	9.624 4682	-48689
	22	313 57 45.6	3 29 15.4	+ 1 31.3	6 59 27.5	- 1 30.3	9.619 4697	51273
	23	317 29 33.3	3 34 23.5	- 0 3.3	7 0 11.6	+ 0 3.4	9.614 2156	53797
	24	321 6 39.7	3 39 52.9	1 40.2	6 59 18.4	1 44.2	9.608 7128	56244
	25	324 49 26.3	3 45 43.8	3 18.0	6 56 40.7	3 32.6	9.602 9700	58593
	26	328 38 14.8	3 51 57.0	- 4 55.0	-6 52 10.4	+ 5 29.3	9.596 9985	-60813
	27	332 33 27.9	3 58 32.8	6 29.3	6 45 39.3	7 34.3	9.590 8127	62875
	28	336 35 27.9	4 5 31.0	7 58.8	6 36 59.0	9 47.8	9.584 4301	64741
	29	340 44 37.3	4 12 51.5	9 21.1	6 26 0.8	12 10.1	9.577 8725	66368
	30	345 1 18.2	4 20 33.8	10 33.6	6 12 36.0	14 40.9	9.571 1661	67706
c.	1	349 25 51.9	4 28 36.9	-11 33.7	-5 56 36.4	+17 19.6	9.564 3427	-68700
	2	353 58 38.4	4 36 59.2	12 18.6	5 37 54.3	20 5.6	9.557 4396	69289
	3	358 39 55.9	4 45 38.4	12 45.5	5 16 23.1	22 57.6	9.550 5007	69406
	4	3 29 59.7	4 54 31.3	12 51.8	4 51 57.7	25 53.7	9.543 5765	69882
	5	8 29 1.8	5 3 34.2	12 35.4	4 24 35.2	28 51.4	9.536 7250	67939
	6	13 37 9.8	5 12 42.1	-11 54.6	-3 54 15.5	+31 47.5	9.530 0117	-66207
	7	18 54 25.6	5 21 48.7	10 48.5	3 21 2.1	34 38.1	9.523 5088	63721
	8	24 20 44.5	5 30 47.1	9 17.5	2 45 2.7	37 18.6	9.517 2947	60420
	9	29 55 54.3	5 39 28.9	7 23.0	2 6 30.0	39 43.8	9.511 4534	56261
	10	35 39 33.6	5 47 44.6	5 8.1	1 25 42.0	41 48.1	9.506 0719	51223
	11	41 31 11.6	5 55 24.5	- 2 37.2	-0 43 2.7	+43 25.5	9.501 2380	-45312
	12	47 30 7.0	6 2 17.6	+ 0 3.6	+0 0 58.1	44 30.3	9.497 0373	38567
	13	53 35 27.7	6 8 13.4	2 47.0	0 45 45.3	44 57.5	9.493 5499	31064
	14	59 46 11.3	6 13 1.9	5 25.0	1 30 39.4	44 43.4	9.490 8459	22919
	15	66 1 5.9	6 16 33.8	7 49.4	2 14 57.6	43 45.7	9.488 9827	14276
	16	72 18 51.0	6 18 42.0	+ 9 52.1	+2 57 56.1	+42 4.1	9.488 0012	- 5317
	17	78 38 0.3	6 19 21.4	11 26.4	3 38 51.7	39 40.4	9.487 9233	+ 3762
	18	84 57 3.5	6 18 29.9	12 27.3	4 17 4.1	36 38.5	9.488 7508	12756
	19	91 14 29.9	6 16 8.0	12 51.8	4 51 57.9	33 4.1	9.490 4650	21467
	20	97 28 50.5	6 12 19.3	12 39.6	5 23 3.9	29 4.4	9.493 0286	29709
	21	103 38 41.7	6 7 10.5	+11 52.3	+5 50 0.8	+24 47.1	9.496 3863	+37330
	22	109 42 47.5	6 0 50.0	10 33.7	6 12 34.8	20 20.1	9.500 4700	44212
	23	115 40 1.2	5 53 28.2	8 49.3	6 30 40.3	15 51.1	9.505 2013	50271
	24	121 29 27.3	5 45 16.5	6 45.2	6 44 18.5	11 26.7	9.510 4952	55460
	25	127 10 21.5	5 36 26.5	4 28.2	6 53 37.2	7 12.7	9.516 2639	59769
	26	132 42 11.3	5 27 9.4	+ 2 4.8	+6 58 48.8	+ 3 13.3	9.522 4202	+63215
	27	138 4 34.9	5 17 35.9	- 0 18.9	7 0 9.7	- 0 28.4	9.528 8794	65837
	28	143 17 20.9	5 7 55.6	2 37.8	6 57 58.6	3 50.6	9.535 5621	67693
	29	148 20 26.6	4 58 16.5	4 47.6	6 52 35.4	6 52.4	9.542 3946	68848
	30	153 13 56.7	4 48 45.6	6 44.8	6 44 20.7	9 33.7	9.549 3107	69375
	31	157 58 2.3	4 39 28.3	- 8 27.2	+6 33 34.7	-11 55.0	9.556 2510	+69346
	32	162 32 59.4	.....	- 9 53.3	+6 20 37.0	.....	9.563 1635	.....

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	T M
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	
Jan. 1	21 38 21.07	+5.370	-14 3 47.1	+51.92	9.639 8535	-2802.8	19.61	20.17	
2	21 40 26.86	5.112	13 43 4.2	51.65	9.633 1044	2821.1	19.90	20.48	
3	21 42 26.41	4.848	13 22 28.2	51.33	9.626 3131	2838.0	20.22	20.81	
4	21 44 19.51	4.576	13 2 1.0	50.93	9.619 4832	2853.3	20.54	21.14	
5	21 46 5.98	4.295	12 41 44.2	50.46	9.612 6187	2866.8	20.86	21.47	
6	21 47 45.63	+4.008	-12 21 39.4	+49.93	9.605 7239	-2878.5	21.20	21.82	
7	21 49 18.28	3.712	12 1 48.3	49.32	9.598 8035	2888.1	21.54	22.17	
8	21 50 43.72	3.407	11 42 12.7	48.63	9.591 8629	2895.3	21.88	22.52	
9	21 52 1.75	3.094	11 22 54.5	47.87	9.584 9083	2899.8	22.24	22.89	
10	21 53 12.17	2.772	11 3 55.7	47.02	9.577 9463	2901.4	22.60	23.26	
11	21 54 14.76	+2.442	-10 45 18.2	+46.09	9.570 9841	-2899.9	22.96	23.63	
12	21 55 9.30	2.102	10 27 4.0	45.08	9.564 0298	2894.8	23.33	24.01	
13	21 55 55.60	1.754	10 9 15.2	43.97	9.557 0923	2885.8	23.71	24.40	
14	21 56 33.43	1.397	9 51 54.2	42.77	9.550 1815	2872.5	24.09	24.79	
15	21 57 2.59	1.032	9 35 3.1	41.47	9.543 3080	2854.5	24.47	25.19	
16	21 57 22.89	+0.658	- 9 18 44.4	+40.08	9.536 4842	-2831.1	24.86	25.59	
17	21 57 34.13	+0.277	9 3 0.3	38.58	9.529 7233	2802.0	25.25	25.99	
18	21 57 36.14	-0.110	8 47 53.2	36.99	9.523 0395	2766.8	25.64	26.39	
19	21 57 28.78	0.504	8 33 25.5	35.30	9.516 4480	2724.9	26.03	26.79	
20	21 57 11.92	0.902	8 19 39.6	33.51	9.509 9658	2675.7	26.43	27.20	
21	21 56 45.48	-1.302	- 8 6 37.9	+31.62	9.503 6108	-2618.8	26.82	27.60	
22	21 56 9.43	1.703	7 54 22.6	29.64	9.497 4020	2553.9	27.20	28.00	
23	21 55 23.75	2.103	7 42 56.0	27.56	9.491 3591	2480.4	27.58	28.39	
24	21 54 28.50	2.500	7 32 20.3	25.40	9.485 5031	2398.1	27.95	28.77	
25	21 53 23.77	2.892	7 22 37.4	23.16	9.479 8558	2306.5	28.32	29.15	
26	21 52 9.72	-3.277	- 7 13 49.3	+20.84	9.474 4395	-2205.5	28.67	29.51	
27	21 50 46.57	3.650	7 5 57.6	18.46	9.469 2768	2095.1	29.02	29.87	
28	21 49 14.62	4.010	6 59 3.8	16.02	9.464 3903	1975.4	29.35	30.21	
29	21 47 34.23	4.353	6 53 9.1	13.54	9.459 8026	1846.1	29.66	30.53	
30	21 45 45.84	4.677	6 48 14.4	11.02	9.455 5366	1707.4	29.95	30.83	
31	21 43 49.94	-4.978	- 6 44 20.5	+ 8.47	9.451 6143	-1559.7	30.23	31.11	
Feb. 1	21 41 47.12	5.253	6 41 27.8	5.92	9.448 0568	1403.5	30.47	31.36	
2	21 39 38.03	5.500	6 39 36.2	3.38	9.444 8841	1239.2	30.69	31.59	
3	21 37 23.39	5.715	6 38 45.4	+ 0.86	9.442 1145	1067.7	30.90	31.80	
4	21 35 3.99	5.896	6 38 54.5	-1.61	9.439 7644	889.7	31.06	31.97	
5	21 32 40.67	-6.041	- 6 40 2.3	- 4.03	9.437 8484	- 706.1	31.20	32.11	
6	21 30 14.30	6.149	6 42 7.2	6.37	9.436 3788	518.0	31.30	32.22	
7	21 27 45.83	6.217	6 45 7.3	8.63	9.435 3646	326.7	31.37	32.29	
8	21 25 16.20	6.245	6 49 0.5	10.78	9.434 8123	- 133.3	31.41	32.33	
9	21 22 46.38	6.233	6 53 43.9	12.81	9.434 7252	+ 60.8	31.42	32.34	
10	21 20 17.34	-6.180	- 6 59 14.3	-14.70	9.435 1039	+ 254.7	31.39	32.31	{
11	21 17 50.03	6.089	7 5 28.6	16.47	9.435 9465	447.2	31.33	32.25	2
12	21 15 25.38	5.959	7 12 23.5	18.08	9.437 2486	637.3	31.24	32.15	2
13	21 13 4.30	5.791	7 19 55.2	19.53	9.439 0025	823.5	31.11	32.02	2
14	21 10 47.68	5.588	7 27 59.8	20.82	9.441 1978	1005.0	30.96	31.86	2
15	21 8 36.34	-5.352	- 7 36 33.4	-21.95	9.443 8220	+1180.8	30.77	31.67	2
16	21 6 31.05	-5.084	- 7 45 31.8	-22.89	9.446 8602	+1349.9	30.56	31.45	2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	" ' "	"			"	"	h m
eb. 16	21 6 31.05	-5.084	- 7 45 31.8	-22.89	9.446 8602	+1349.9	30.56	31.45	23 18.1
17	21 4 32.53	4.788	7 54 50.9	23.67	9.450 2960	1512.0	30.31	31.20	23 12.3
18	21 2 41.43	4.466	8 4 26.8	24.29	9.454 1114	1666.1	30.05	30.93	23 6.7
19	21 0 58.33	4.122	8 14 15.3	24.73	9.458 2864	1811.5	29.76	30.63	23 1.2
20	20 59 23.74	3.758	8 24 12.5	25.01	9.462 7997	1948.1	29.46	30.32	22 55.8
21	20 57 58.09	-3.377	- 8 34 14.5	-25.14	9.467 6298	+2075.4	29.13	29.98	22 50.6
22	20 56 41.74	2.983	8 44 17.8	25.11	9.472 7543	2193.4	28.79	29.63	22 45.6
23	20 55 35.00	2.577	8 54 18.8	24.95	9.478 1507	2302.0	28.43	29.26	22 40.7
24	20 54 38.09	2.164	9 4 14.2	24.65	9.483 7964	2401.2	28.07	28.89	22 36.0
25	20 53 51.15	1.747	9 14 1.0	24.23	9.489 6690	2491.1	27.69	28.50	22 31.4
26	20 53 14.26	-1.327	- 9 23 36.3	-23.69	9.495 7463	+2571.9	27.30	28.10	22 27.0
27	20 52 47.46	0.906	9 32 57.5	23.06	9.502 0072	2644.1	26.91	27.70	22 22.8
28	20 52 30.74	0.488	9 42 2.2	22.32	9.508 4315	2708.0	26.51	27.29	22 18.8
ar. 1	20 52 24.03	-0.073	9 50 48.1	21.50	9.514 9994	2763.9	26.12	26.88	22 14.9
2	20 52 27.22	+0.337	9 59 13.4	20.60	9.521 6922	2812.2	25.72	26.47	22 11.2
3	20 52 40.17	+0.740	-10 7 16.1	-19.62	9.528 4922	+2853.3	25.32	26.06	22 7.6
4	20 53 2.70	1.136	10 14 54.7	18.58	9.535 3829	2887.8	24.92	25.65	22 4.2
5	20 53 34.61	1.522	10 22 7.6	17.49	9.542 3488	2916.1	24.52	25.24	22 0.9
6	20 54 15.68	1.899	10 28 53.7	16.34	9.549 3756	2938.6	24.13	24.84	21 57.8
7	20 55 5.66	2.265	10 35 11.7	15.15	9.556 4498	2955.7	23.75	24.44	21 54.8
8	20 56 4.29	+2.619	-10 41 0.7	-13.92	9.563 5591	+2967.9	23.36	24.04	21 52.0
9	20 57 11.30	2.963	10 46 19.8	12.66	9.570 6922	2975.7	22.98	23.65	21 49.3
10	20 58 26.41	3.295	10 51 8.2	11.37	9.577 8391	2979.4	22.60	23.26	21 46.7
11	20 59 49.34	3.614	10 55 25.4	10.06	9.584 9906	2979.6	22.23	22.88	21 44.3
12	21 1 19.79	3.921	10 59 10.8	8.72	9.592 1386	2976.5	21.87	22.51	21 42.0
13	21 2 57.48	+4.217	-11 2 23.9	-7.37	9.599 2756	+2970.5	21.51	22.14	21 39.8
14	21 4 42.13	4.502	11 5 4.4	6.00	9.606 3952	2962.1	21.16	21.78	21 37.7
15	21 6 33.47	4.775	11 7 11.9	4.62	9.613 4917	2951.3	20.82	21.43	21 35.7
16	21 8 31.22	5.036	11 8 46.0	3.22	9.620 5600	2938.6	20.48	21.08	21 33.8
17	21 10 35.13	5.287	11 9 46.6	1.82	9.627 5955	2924.1	20.15	20.74	21 32.0
18	21 12 44.94	+5.528	-11 10 13.4	-0.41	9.634 5942	+2908.0	19.83	20.41	21 30.3
19	21 15 0.40	5.759	11 10 6.3	+1.01	9.641 5525	2890.4	19.52	20.09	21 28.7
20	21 17 21.28	5.980	11 9 25.0	2.44	9.648 4670	2871.5	19.21	19.77	21 27.2
21	21 19 47.35	6.191	11 8 9.4	3.87	9.655 3349	2851.5	18.91	19.46	21 25.8
22	21 22 18.39	6.394	11 6 19.4	5.30	9.662 1536	2830.5	18.62	19.16	21 24.4
23	21 24 54.19	+6.588	-11 3 55.1	+6.73	9.668 9207	+2808.6	18.32	18.86	21 23.1
24	21 27 34.52	6.772	11 0 56.4	8.16	9.675 6340	2785.8	18.04	18.57	21 21.9
25	21 30 19.18	6.948	10 57 23.5	9.59	9.682 2918	2762.3	17.77	18.29	21 20.8
26	21 33 7.98	7.117	10 53 16.3	11.01	9.688 8926	2738.2	17.50	18.01	21 19.7
27	21 36 0.72	7.277	10 48 35.1	12.43	9.695 4349	2713.6	17.24	17.74	21 18.7
28	21 38 57.23	+7.431	-10 43 19.9	+13.84	9.701 9175	+2688.5	16.98	17.48	21 17.7
29	21 41 57.33	7.576	10 37 31.1	15.24	9.708 3395	2663.1	16.73	17.22	21 16.9
30	21 45 0.83	7.714	10 31 8.7	16.63	9.714 7000	2637.3	16.49	16.97	21 16.0
31	21 48 7.57	7.846	10 24 13.1	18.00	9.720 9982	2611.2	16.25	16.73	21 15.2
pr. 1	21 51 17.40	7.972	10 16 44.6	19.37	9.727 2337	2585.0	16.02	16.49	21 14.5
2	21 54 30.16	+8.091	-10 8 43.5	+20.72	9.733 4059	+2558.5	15.80	16.26	21 13.8
3	21 57 45.70	+8.203	-10 0 10.2	+22.05	9.739 5146	+2532.0	15.57	16.03	21 13.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	T ₀
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	G
Apr. 1	h m s	s	° ' "	"			"	"	1
2	21 51 17.40	+ 7.972	-10 16 44.6	+19.37	9.727 2337	+2585.0	16.02	16.49	2
3	21 54 30.16	8.091	10 8 43.5	20.72	9.733 4059	2558.5	15.80	16.26	2
4	21 57 45.70	8.203	10 0 10.2	22.05	9.739 5146	2532.0	15.57	16.03	2
5	22 1 3.87	8.310	9 51 5.1	23.37	9.745 5594	2505.4	15.36	15.81	2
6	22 4 24.55	8.412	9 41 28.5	24.67	9.751 5404	2478.8	15.15	15.59	2
7	22 7 47.59	+ 8.507	- 9 31 21.0	+25.95	9.757 4576	+2452.2	14.94	15.38	2
8	22 11 12.86	8.598	9 20 43.0	27.21	9.763 3110	2425.7	14.75	15.18	2
9	22 14 40.24	8.683	9 9 35.1	28.45	9.769 1010	2399.3	14.55	14.98	2
10	22 18 9.61	8.764	8 57 57.7	29.67	9.774 8278	2373.1	14.36	14.78	2
11	22 21 40.86	8.840	8 45 51.3	30.86	9.780 4920	2347.1	14.18	14.59	2
12	22 25 13.89	+ 8.912	- 8 33 16.5	+32.04	9.786 0942	+2321.4	13.99	14.40	2
13	22 28 48.59	8.979	8 20 13.8	33.19	9.791 6352	2296.1	13.82	14.22	2
14	22 32 24.87	9.043	8 6 43.7	34.32	9.797 1157	2271.0	13.64	14.04	2
15	22 36 2.65	9.104	7 52 46.8	35.42	9.802 5364	2246.3	13.48	13.87	2
16	22 39 41.84	9.161	7 38 23.6	36.51	9.807 8982	2221.9	13.31	13.70	2
17	22 43 22.38	+ 9.216	- 7 23 34.6	+37.57	9.813 2018	+2197.8	13.15	13.53	2
18	22 47 4.20	9.269	7 8 20.4	38.61	9.818 4481	2174.1	12.99	13.37	2
19	22 50 47.25	9.318	6 52 41.4	39.63	9.823 6378	2150.7	12.83	13.21	2
20	22 54 31.45	9.365	6 36 38.3	40.63	9.828 7715	2127.5	12.68	13.05	2
21	22 58 16.75	9.410	6 20 11.5	41.60	9.833 8499	2104.6	12.53	12.90	2
22	23 2 3.12	+ 9.453	- 6 3 21.6	+42.55	9.838 8738	+2082.0	12.39	12.75	2
23	23 5 50.50	9.494	5 46 9.3	43.47	9.843 8436	2059.6	12.25	12.61	2
24	23 9 38.84	9.534	5 28 35.0	44.38	9.848 7601	2037.5	12.12	12.47	2
25	23 13 28.11	9.572	5 10 39.5	45.25	9.853 6238	2015.6	11.98	12.33	2
26	23 17 18.28	9.608	4 52 23.2	46.10	9.858 4353	1994.0	11.84	12.19	2
27	23 21 9.30	+ 9.643	- 4 33 46.8	+46.92	9.863 1951	+1972.5	11.72	12.06	2
28	23 25 1.15	9.678	4 14 51.0	47.72	9.867 9037	1951.3	11.59	11.93	2
29	23 28 53.81	9.711	3 55 36.3	48.50	9.872 5617	1930.4	11.46	11.80	2
30	23 32 47.25	9.742	3 36 3.4	49.24	9.877 1696	1909.5	11.35	11.68	2
May 1	23 36 41.44	9.773	3 16 12.9	49.96	9.881 7277	1888.9	11.22	11.55	2
2	23 40 36.35	+ 9.803	- 2 56 5.5	+50.65	9.886 2367	+1868.5	11.12	11.44	2
3	23 44 31.98	9.833	2 35 41.9	51.31	9.890 6968	1848.3	11.00	11.32	2
4	23 48 28.30	9.861	2 15 2.7	51.95	9.895 1087	1828.3	10.88	11.20	2
5	23 52 25.29	9.888	1 54 8.6	52.55	9.899 4727	1808.5	10.78	11.09	2
6	23 56 22.94	9.915	1 33 0.4	53.13	9.903 7895	1788.8	10.67	10.98	2
7	0 0 21.23	+ 9.942	- 1 11 38.7	+53.68	9.908 0593	+1769.4	10.56	10.87	2
8	0 4 20.15	9.968	0 50 4.2	54.19	9.912 2828	1750.2	10.46	10.77	2
9	0 8 19.68	9.993	0 28 17.7	54.68	9.916 4605	1731.3	10.37	10.67	2
10	0 12 19.83	10.019	- 0 6 19.8	55.14	9.920 5931	1712.6	10.27	10.57	2
11	0 16 20.57	10.043	+ 0 15 48.7	55.57	9.924 6812	1694.2	10.17	10.47	2
12	0 20 21.91	+10.068	+ 0 38 7.2	+55.97	9.928 7255	+1676.1	10.08	10.37	2
13	0 24 23.84	10.093	1 0 34.9	56.34	9.932 7266	1658.3	9.98	10.27	2
14	0 28 26.37	10.118	1 23 11.3	56.68	9.936 6854	1640.7	9.89	10.18	2
15	0 32 29.49	10.142	1 45 55.6	57.00	9.940 6023	1623.4	9.80	10.09	2
16	0 36 33.21	10.168	2 8 47.2	57.29	9.944 4782	1606.5	9.72	10.00	2
17	0 40 37.55	+10.194	+ 2 31 45.5	+57.56	9.948 3137	+1589.8	9.63	9.91	2
18	0 44 42.50	+10.219	+ 2 54 49.7	+57.79	9.952 1094	+1573.3	9.55	9.83	2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
May 17	0 44 42.50	+10.219	+ 2 54 49.7	+57.79	9.952 1094	+1578.3	9.55	9.83	21 7.4
18	0 48 48.09	10.246	3 17 59.1	57.99	9.955 8657	1557.0	9.46	9.74	21 7.5
19	0 52 54.33	10.274	3 41 13.2	58.18	9.959 5832	1541.0	9.39	9.66	21 7.7
20	0 57 1.23	10.301	4 4 31.3	58.32	9.963 2625	1525.1	9.31	9.58	21 7.9
21	1 1 8.80	10.330	4 27 52.6	58.45	9.966 9040	1509.5	9.23	9.50	21 8.1
22	1 5 17.06	+10.359	+ 4 51 16.6	+58.55	9.970 5082	+1494.0	9.15	9.42	21 8.3
23	1 9 26.03	10.389	5 14 42.6	58.61	9.974 0754	1478.7	9.07	9.34	21 8.5
24	1 13 35.72	10.419	5 38 9.9	58.63	9.977 6061	1463.6	9.01	9.27	21 8.7
25	1 17 46.15	10.450	6 1 37.8	58.66	9.981 1008	1448.6	8.93	9.19	21 9.0
26	1 21 57.34	10.482	6 25 5.6	58.65	9.984 5596	1433.8	8.86	9.12	21 9.2
27	1 26 9.32	+10.516	+ 6 48 32.6	+58.60	9.987 9831	+1419.1	8.79	9.05	21 9.5
28	1 30 22.10	10.549	7 11 58.1	58.52	9.991 3714	1404.5	8.72	8.98	21 9.8
29	1 34 35.70	10.584	7 35 21.5	58.42	9.994 7248	1390.0	8.66	8.91	21 10.1
30	1 38 50.14	10.619	7 58 42.0	58.29	9.998 0435	1375.6	8.59	8.84	21 10.4
31	1 43 5.43	10.655	8 21 59.0	58.12	0.001 3278	1361.3	8.52	8.77	21 10.7
June 1	1 47 21.59	+10.692	+ 8 45 11.7	+57.93	0.004 5779	+1347.1	8.46	8.71	21 11.0
2	1 51 38.64	10.729	9 8 19.4	57.71	0.007 7941	1333.1	8.39	8.64	21 11.4
3	1 55 56.58	10.767	9 31 21.4	57.45	0.010 9767	1319.1	8.34	8.58	21 11.8
4	2 0 15.45	10.806	9 54 16.9	57.17	0.014 1260	1305.3	8.28	8.52	21 12.1
5	2 4 35.25	10.845	10 17 5.3	56.86	0.017 2422	1291.6	8.22	8.46	21 12.5
6	2 8 56.00	+10.885	+10 39 45.8	+56.51	0.020 3257	+1278.0	8.16	8.40	21 13.0
7	2 13 17.71	10.925	11 2 17.6	56.14	0.023 3768	1264.6	8.10	8.34	21 13.4
8	2 17 40.39	10.965	11 24 40.1	55.73	0.026 3958	1251.3	8.04	8.28	21 13.8
9	2 22 4.06	11.007	11 46 52.5	55.30	0.029 3833	1238.2	7.99	8.22	21 14.3
10	2 26 28.72	11.049	12 8 54.1	54.83	0.032 3395	1225.3	7.94	8.17	21 14.8
11	2 30 54.39	+11.091	+12 30 44.3	+54.34	0.035 2650	+1212.6	7.88	8.11	21 15.3
12	2 35 21.10	11.135	12 52 22.3	53.82	0.038 1602	1200.1	7.83	8.06	21 15.8
13	2 39 48.86	11.178	13 13 47.5	53.27	0.041 0254	1187.6	7.78	8.01	21 16.3
14	2 44 17.67	11.223	13 34 59.0	52.69	0.043 8609	1175.4	7.72	7.95	21 16.9
15	2 48 47.56	11.268	13 55 56.3	52.08	0.046 6673	1163.3	7.68	7.90	21 17.5
16	2 53 18.54	+11.314	+14 16 38.6	+51.44	0.049 4449	+1151.4	7.63	7.85	21 18.1
17	2 57 50.62	11.360	14 37 5.3	50.78	0.052 1939	1139.5	7.58	7.80	21 18.7
18	3 2 23.82	11.407	14 57 15.6	50.08	0.054 9148	1127.9	7.54	7.76	21 19.3
19	3 6 58.14	11.454	15 17 8.8	49.35	0.057 6078	1116.3	7.49	7.71	21 19.9
20	3 11 33.61	11.502	15 36 44.3	48.60	0.060 2732	1104.9	7.44	7.66	21 20.6
21	3 16 10.22	+11.550	+15 56 1.3	+47.81	0.062 9112	+1093.5	7.39	7.61	21 21.3
22	3 20 48.00	11.599	16 14 59.2	47.00	0.065 5222	1082.3	7.36	7.57	21 22.0
23	3 25 26.95	11.648	16 33 37.3	46.17	0.068 1064	1071.2	7.31	7.52	21 22.7
24	3 30 7.08	11.697	16 51 54.9	45.29	0.070 6640	1060.2	7.27	7.48	21 23.5
25	3 34 48.40	11.746	17 9 51.2	44.39	0.073 1952	1049.2	7.23	7.44	21 24.2
26	3 39 30.91	+11.796	+17 27 25.6	+43.47	0.075 7000	+1038.2	7.18	7.39	21 25.0
27	3 44 14.61	11.846	17 44 37.4	42.51	0.078 1787	1027.4	7.14	7.35	21 25.8
28	3 48 59.50	11.895	18 1 26.0	41.53	0.080 6314	1016.5	7.10	7.31	21 26.7
29	3 53 45.58	11.945	18 17 50.6	40.51	0.083 0581	1005.8	7.06	7.27	21 27.5
30	3 58 32.84	11.994	18 33 50.5	39.47	0.085 4590	995.0	7.02	7.23	21 28.4
July 1	4 3 21.27	+12.042	+18 49 25.1	+38.41	0.087 8341	+ 984.3	6.99	7.19	21 29.2
2	4 8 10.88	+12.091	+19 4 33.8	+37.31	0.090 1836	+ 973.7	6.95	7.15	21 30.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	h m
July	1	4	3 21.27	+12.042	+18 49 25.1	+38.41	0.087 8341	+984.3	6.99	7.19	21 29.2
	2	4	8 10.88	12.091	19 4 33.8	37.31	0.090 1836	973.7	6.95	7.15	21 30.1
	3	4	13 1.64	12.139	19 19 15.8	36.19	0.092 5077	963.1	6.91	7.11	21 31.1
	4	4	17 53.54	12.186	19 33 30.5	35.03	0.094 8064	952.6	6.87	7.07	21 32.0
	5	4	22 46.57	12.233	19 47 17.2	33.86	0.097 0800	942.1	6.84	7.04	21 33.0
	6	4	27 40.70	+12.278	+20 0 35.5	+32.66	0.099 3285	+931.7	6.80	7.00	21 33.9
	7	4	32 35.90	12.322	20 13 24.7	31.43	0.101 5523	921.5	6.76	6.96	21 34.9
	8	4	37 32.17	12.366	20 25 44.1	30.18	0.103 7516	911.3	6.73	6.93	21 35.9
	9	4	42 29.47	12.409	20 37 33.2	28.91	0.105 9265	901.2	6.70	6.90	21 37.0
	10	4	47 27.78	12.450	20 48 51.4	27.61	0.108 0775	891.3	6.67	6.86	21 38.0
	11	4	52 27.08	+12.491	+20 59 38.3	+26.29	0.110 2047	+881.4	6.64	6.83	21 39.1
	12	4	57 27.33	12.530	21 9 53.1	24.95	0.112 3084	871.7	6.60	6.79	21 40.2
	13	5	2 28.51	12.568	21 19 35.6	23.59	0.114 3888	862.0	6.57	6.76	21 41.2
	14	5	7 30.59	12.605	21 28 45.1	22.20	0.116 4463	852.6	6.54	6.73	21 42.3
	15	5	12 33.53	12.640	21 37 21.2	20.80	0.118 4811	843.1	6.51	6.70	21 43.5
	16	5	17 37.30	+12.674	+21 45 23.4	+19.38	0.120 4933	+833.8	6.48	6.67	21 44.6
	17	5	22 41.88	12.707	21 52 51.3	17.94	0.122 4833	824.6	6.45	6.64	21 45.7
	18	5	27 47.22	12.738	21 59 44.4	16.48	0.124 4512	815.4	6.42	6.61	21 46.9
	19	5	32 53.30	12.767	22 6 2.2	15.00	0.126 3972	806.3	6.39	6.58	21 48.1
	20	5	38 0.05	12.795	22 11 44.5	13.52	0.128 3216	797.3	6.36	6.55	21 49.3
	21	5	43 7.46	+12.822	+22 16 50.9	+12.01	0.130 2245	+788.4	6.33	6.52	21 50.4
	22	5	48 15.48	12.847	22 21 21.1	10.50	0.132 1061	779.6	6.31	6.49	21 51.6
	23	5	53 24.08	12.870	22 25 14.6	8.96	0.133 9664	770.7	6.28	6.46	21 52.8
	24	5	58 33.20	12.890	22 28 31.2	7.42	0.135 8057	762.0	6.26	6.44	21 54.1
	25	6	3 42.80	12.909	22 31 10.7	5.87	0.137 6240	753.3	6.23	6.41	21 55.3
	26	6	8 52.84	+12.927	+22 33 12.7	+4.30	0.139 4214	+744.6	6.20	6.38	21 56.5
	27	6	14 3.28	12.943	22 34 37.1	2.73	0.141 1980	735.9	6.18	6.36	21 57.8
	28	6	19 14.06	12.956	22 35 23.6	+1.15	0.142 9537	727.2	6.15	6.33	21 59.0
	29	6	24 25.14	12.967	22 35 32.1	-0.44	0.144 6887	718.6	6.13	6.31	22 0.3
	30	6	29 36.47	12.976	22 35 2.4	2.04	0.146 4029	709.9	6.10	6.28	22 1.5
	31	6	34 47.99	+12.984	+22 33 54.4	-3.63	0.148 0964	+701.3	6.08	6.26	22 2.8
Aug.	1	6	39 59.66	12.988	22 32 8.1	5.23	0.149 7692	692.7	6.05	6.23	22 4.0
	2	6	45 11.41	12.991	22 29 43.4	6.83	0.151 4215	684.2	6.03	6.21	22 5.3
	3	6	50 23.20	12.991	22 26 40.2	8.43	0.153 0533	675.7	6.01	6.19	22 6.5
	4	6	55 34.97	12.989	22 22 58.6	10.04	0.154 6647	667.2	5.99	6.16	22 7.8
	5	7	0 46.67	+12.985	+22 18 38.5	-11.63	0.156 2559	+658.8	5.97	6.14	22 9.0
	6	7	5 58.25	12.979	22 13 40.2	13.23	0.157 8271	650.5	5.95	6.12	22 10.3
	7	7	11 9.66	12.971	22 8 3.6	14.82	0.159 3783	642.2	5.93	6.10	22 11.5
	8	7	16 20.84	12.961	22 1 48.8	16.41	0.160 9097	634.0	5.91	6.08	22 12.8
	9	7	21 31.76	12.949	21 54 56.1	17.99	0.162 4215	625.9	5.88	6.05	22 14.0
	10	7	26 42.37	+12.935	+21 47 25.5	-19.56	0.163 9140	+617.9	5.86	6.03	22 15.2
	11	7	31 52.62	12.919	21 39 17.3	21.12	0.165 3873	609.9	5.84	6.01	22 16.5
	12	7	37 2.46	12.901	21 30 31.7	22.68	0.166 8416	602.0	5.82	5.99	22 17.7
	13	7	42 11.85	12.881	21 21 8.9	24.22	0.168 2771	594.2	5.80	5.97	22 18.9
	14	7	47 20.76	12.860	21 11 9.2	25.75	0.169 6938	586.4	5.78	5.95	22 20.1
	15	7	52 29.14	+12.838	+21 0 32.9	-27.27	0.171 0920	+578.8	5.76	5.93	22 21.3
	16	7	57 36.96	+12.814	+20 49 20.2	-28.78	0.172 4720	+571.2	5.75	5.92	22 22.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
Aug.	16	h m s	s	" ' "	"								h m
	7 57 36.96	+12.814	+20 49 20.2	-28.78	0.172 4720	+571.2	5.75	5.92	22 22.4				
	8 2 44.18	12.788	20 37 31.6	30.27	0.173 8338	563.6	5.73	5.90	22 23.6				
	8 7 50.78	12.761	20 25 7.3	31.75	0.175 1776	556.2	5.71	5.88	22 24.8				
	8 12 56.72	12.734	20 12 7.7	33.21	0.176 5036	548.8	5.69	5.86	22 25.9				
	8 18 1.98	12.705	19 58 33.3	34.66	0.177 8120	541.5	5.67	5.84	22 27.1				
	8 23 6.53	+12.674	+19 44 24.3	-36.09	0.179 1028	+534.2	5.66	5.83	22 28.2				
	8 28 10.34	12.643	19 29 41.3	37.50	0.180 3761	526.9	5.64	5.81	22 29.3				
	8 33 13.40	12.612	19 14 24.6	38.89	0.181 6321	519.7	5.63	5.79	22 30.4				
	8 38 15.69	12.579	18 58 34.8	40.26	0.182 8708	512.5	5.62	5.78	22 31.5				
25	8 43 17.19	12.546	18 42 12.3	41.61	0.184 0922	505.3	5.60	5.76	22 32.5				
26	8 48 17.88	+12.512	+18 25 17.5	-42.95	0.185 2963	+498.1	5.58	5.74	22 33.6				
27	8 53 17.75	12.477	18 7 51.1	44.25	0.186 4831	490.9	5.57	5.73	22 34.6				
28	8 58 16.78	12.442	17 49 53.5	45.54	0.187 6526	483.7	5.55	5.71	22 35.7				
29	9 3 14.96	12.406	17 31 25.4	46.80	0.188 8049	476.5	5.54	5.70	22 36.7				
30	9 8 12.29	12.371	17 12 27.2	48.04	0.189 9400	469.4	5.52	5.68	22 37.7				
Sept.	31	9 13 8.75	+12.334	+16 52 59.7	-49.25	0.191 0579	+462.2	5.51	5.67	22 38.7			
	1	9 18 4.33	12.298	16 33 3.3	50.44	0.192 1586	455.1	5.49	5.65	22 39.6			
	2	9 22 59.04	12.261	16 12 38.7	51.60	0.193 2423	447.9	5.48	5.64	22 40.6			
	3	9 27 52.85	12.224	15 51 46.5	52.74	0.194 3090	441.0	5.47	5.63	22 41.5			
	4	9 32 45.78	12.187	15 30 27.3	53.85	0.195 3589	434.0	5.45	5.61	22 42.5			
	5	9 37 37.82	+12.150	+15 8 41.8	-54.93	0.196 3920	+427.0	5.44	5.60	22 43.4			
	6	9 42 28.99	12.114	14 46 30.7	55.99	0.197 4086	420.1	5.43	5.59	22 44.3			
	7	9 47 19.28	12.077	14 23 54.5	57.02	0.198 4086	413.2	5.41	5.57	22 45.2			
	8	9 52 8.70	12.041	14 0 54.0	58.02	0.199 3922	406.4	5.40	5.56	22 46.0			
	9	9 56 57.25	12.006	13 37 29.8	58.99	0.200 3596	399.7	5.39	5.55	22 46.9			
10	10 1 44.96	+11.970	+13 13 42.6	-59.94	0.201 3109	+393.1	5.38	5.54	22 47.7				
11	10 6 31.83	11.936	12 49 33.1	60.85	0.202 2463	386.4	5.36	5.52	22 48.5				
12	10 11 17.88	11.902	12 25 1.9	61.74	0.203 1659	379.9	5.35	5.51	22 49.4				
13	10 16 3.13	11.869	12 0 9.7	62.61	0.204 0699	373.4	5.34	5.50	22 50.1				
14	10 20 47.60	11.836	11 34 57.1	63.44	0.204 9584	367.0	5.33	5.49	22 50.9				
15	10 25 31.29	+11.805	+11 9 25.0	-64.24	0.205 8316	+360.6	5.32	5.48	22 51.7				
16	10 30 14.24	11.775	10 43 33.9	65.01	0.206 6898	354.5	5.31	5.47	22 52.5				
17	10 34 56.48	11.745	10 17 24.6	65.76	0.207 5330	348.2	5.30	5.46	22 53.2				
18	10 39 38.02	11.717	9 50 57.6	66.48	0.208 3613	342.1	5.30	5.45	22 54.0				
19	10 44 18.89	11.690	9 24 13.8	67.17	0.209 1749	336.0	5.29	5.44	22 54.7				
20	10 48 59.13	+11.664	+8 57 13.8	-67.83	0.209 9739	+329.9	5.28	5.43	22 55.4				
21	10 53 38.76	11.639	8 29 58.2	68.46	0.210 7583	323.8	5.27	5.42	22 56.1				
22	10 58 17.82	11.616	8 2 27.9	69.06	0.211 5282	317.8	5.26	5.41	22 56.8				
23	11 2 56.33	11.594	7 34 43.5	69.64	0.212 2836	311.7	5.25	5.40	22 57.5				
24	11 7 34.34	11.574	7 6 45.6	70.18	0.213 0246	305.8	5.24	5.39	22 58.2				
25	11 12 11.87	+11.554	+6 38 35.1	-70.69	0.213 7512	+299.8	5.23	5.38	22 58.9				
26	11 16 48.95	11.536	6 10 12.6	71.18	0.214 4634	293.7	5.22	5.37	22 59.5				
27	11 21 25.62	11.520	5 41 38.8	71.63	0.215 1611	287.7	5.21	5.36	23 0.2				
28	11 26 1.92	11.505	5 12 54.5	72.06	0.215 8443	281.7	5.20	5.35	23 0.9				
29	11 30 37.87	11.491	4 44 0.4	72.45	0.216 5132	275.7	5.20	5.35	23 1.5				
30	11 35 13.51	+11.479	+4 14 57.3	-72.81	0.217 1677	+269.7	5.19	5.34	23 2.2				
Oct.	1	11 39 48.88	+11.469	+3 45 45.8	-73.14	0.217 8079	+263.8	5.18	5.33	23 2.8			

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	T	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.		
	h	m	s	s	°	'	"	"						
Oct.	1	11	39	48.88	+11.469	+ 3	45	45.8	-73.14	0.217 8079	+263.8	5.18	5.33	2
	2	11	44	24.01	11.459	3	16	26.7	73.44	0.218 4338	257.8	5.17	5.32	2
	3	11	48	58.93	11.451	2	47	0.8	73.71	0.219 0454	251.9	5.16	5.31	2
	4	11	53	33.68	11.445	2	17	28.8	73.95	0.219 6430	246.1	5.16	5.31	2
	5	11	58	8.30	11.440	1	47	51.5	74.16	0.220 2265	240.2	5.15	5.30	2
	6	12	2	42.83	+11.437	+ 1	18	9.5	-74.34	0.220 7961	+234.5	5.14	5.29	2
	7	12	7	17.30	11.436	0	48	23.7	74.48	0.221 3519	228.7	5.14	5.29	2
	8	12	11	51.75	11.435	+ 0	18	34.8	74.59	0.221 8939	223.0	5.13	5.28	2
	9	12	16	26.21	11.437	- 0	11	16.5	74.68	0.222 4223	217.4	5.12	5.27	2
	10	12	21	0.74	11.440	0	41	9.4	74.73	0.222 9373	211.8	5.12	5.27	2
	11	12	25	35.36	+11.445	- 1	11	3.2	-74.75	0.223 4389	+206.2	5.11	5.26	2
	12	12	30	10.12	11.452	1	40	57.2	74.74	0.223 9273	200.8	5.11	5.26	2
	13	12	34	45.05	11.460	2	10	50.6	74.70	0.224 4026	195.3	5.10	5.25	2
	14	12	39	20.20	11.470	2	40	42.7	74.63	0.224 8650	190.0	5.09	5.24	2
	15	12	43	55.61	11.481	3	10	32.7	74.53	0.225 3146	184.7	5.09	5.24	2
	16	12	48	31.31	+11.494	- 3	40	19.9	-74.40	0.225 7517	+179.5	5.08	5.23	2
	17	12	53	7.35	11.509	4	10	3.5	74.23	0.226 1762	174.3	5.08	5.23	2
	18	12	57	43.77	11.526	4	39	42.8	74.04	0.226 5884	169.2	5.07	5.22	2
	19	13	2	20.62	11.545	5	9	17.1	73.81	0.226 9884	164.1	5.07	5.22	2
	20	13	6	57.94	11.565	5	38	45.5	73.55	0.227 3762	159.0	5.06	5.21	2
	21	13	11	35.76	+11.587	- 6	8	7.4	-73.27	0.227 7518	+154.0	5.06	5.21	2
	22	13	16	14.13	11.611	6	37	22.0	72.95	0.228 1155	149.0	5.05	5.20	2
	23	13	20	53.10	11.636	7	6	28.6	72.60	0.228 4670	144.0	5.05	5.20	2
	24	13	25	32.69	11.663	7	35	26.3	72.21	0.228 8065	138.9	5.05	5.20	2
	25	13	30	12.95	11.692	8	4	14.3	71.79	0.229 1338	133.9	5.04	5.19	2
	26	13	34	53.92	+11.722	- 8	32	52.0	-71.34	0.229 4491	+128.9	5.04	5.19	2
	27	13	39	35.64	11.754	9	1	18.4	70.86	0.229 7523	123.8	5.03	5.18	2
	28	13	44	18.13	11.787	9	29	32.9	70.34	0.230 0434	118.8	5.03	5.18	2
	29	13	49	1.43	11.822	9	57	34.6	69.79	0.230 3225	113.8	5.03	5.18	2
	30	13	53	45.58	11.858	10	25	22.7	69.21	0.230 5895	108.8	5.02	5.17	2
31	13	58	30.61	+11.895	-10	52	56.3	-68.59	0.230 8446	+103.8	5.02	5.17	2	
Nov.	1	14	3	16.55	11.933	11	20	14.8	67.94	0.231 0876	98.8	5.02	5.17	2
	2	14	8	3.42	11.973	11	47	17.2	67.26	0.231 3186	93.8	5.02	5.17	2
	3	14	12	51.26	12.014	12	14	2.8	66.54	0.231 5377	88.8	5.01	5.16	2
	4	14	17	40.09	12.056	12	40	30.8	65.79	0.231 7449	83.9	5.01	5.16	2
	5	14	22	29.94	+12.099	-13	6	40.4	-65.00	0.231 9404	+ 79.0	5.01	5.16	2
	6	14	27	20.83	12.143	13	32	30.7	64.19	0.232 1241	74.1	5.01	5.16	2
	7	14	32	12.79	12.188	13	58	1.0	63.33	0.232 2962	69.3	5.00	5.15	2
	8	14	37	5.84	12.233	14	23	10.3	62.44	0.232 4569	64.6	5.00	5.15	2
	9	14	41	59.99	12.280	14	47	58.0	61.52	0.232 6061	59.8	5.00	5.15	2
	10	14	46	55.27	+12.327	-15	12	23.2	-60.57	0.232 7440	+ 55.1	5.00	5.15	2
	11	14	51	51.69	12.375	15	36	25.1	59.59	0.232 8707	50.5	5.00	5.15	2
	12	14	56	49.27	12.424	16	0	3.0	58.56	0.232 9864	45.9	5.00	5.15	2
	13	15	1	48.03	12.473	16	23	15.9	57.51	0.233 0911	41.3	4.99	5.14	2
	14	15	6	47.97	12.522	16	46	3.2	56.42	0.233 1849	36.9	4.99	5.14	2
	15	15	11	49.11	+12.572	-17	8	24.0	-55.30	0.233 2680	+ 32.4	4.99	5.14	2
	16	15	16	51.45	+12.623	-17	30	17.5	-54.15	0.233 3404	+ 28.0	4.99	5.14	2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h m s	s	° ' "		° ' "	h m s							
ov. 16	15	16	51.45	+12.622	-17	30	17.5	-34.15	0.233 3404	+ 28.0	4.99	5.14	23 39.0
17	15	21	55.01	12.674	17	51	43.0	32.97	0.233 4024	23.6	4.99	5.14	23 40.1
18	15	26	59.79	12.725	18	12	39.7	51.75	0.233 4539	19.3	4.99	5.14	23 41.3
19	15	32	5.80	12.776	18	33	6.8	50.50	0.233 4952	15.0	4.99	5.14	23 42.5
20	15	37	13.04	12.827	18	53	3.6	49.22	0.233 5261	10.7	4.99	5.14	23 43.7
21	15	42	21.50	+12.878	-19	12	29.3	-47.91	0.233 5467	+ 6.4	4.99	5.14	23 44.9
22	15	47	31.19	12.929	19	31	23.1	46.57	0.233 5569	+ 2.1	4.99	5.14	23 46.1
23	15	52	42.10	12.980	19	49	44.3	45.19	0.233 5567	- 2.2	4.99	5.14	23 47.4
24	15	57	54.21	13.030	20	7	32.2	43.79	0.233 5461	6.6	4.99	5.14	23 48.7
25	16	3	7.51	13.079	20	24	46.1	42.36	0.233 5250	10.9	4.99	5.14	23 50.0
26	16	8	21.98	+13.127	-20	41	25.2	-40.90	0.233 4936	- 15.3	4.99	5.14	23 51.3
27	16	13	37.61	13.175	20	57	28.9	39.40	0.233 4517	19.6	4.99	5.14	23 52.6
28	16	18	54.37	13.222	21	12	56.4	37.89	0.233 3993	24.0	4.99	5.14	23 54.0
29	16	24	12.23	13.267	21	27	47.2	36.34	0.233 3363	28.4	4.99	5.14	23 55.3
30	16	29	31.16	13.311	21	42	0.5	34.77	0.233 2628	32.8	4.99	5.14	23 56.7
oc. 1	16	34	51.14	+13.354	-21	55	35.8	-33.17	0.233 1787	- 37.2	4.99	5.14	23 58.1
2	16	40	12.12	13.395	22	8	32.4	31.54	0.233 0840	41.6	4.99	5.14	23 59.6
3	16	45	34.08	13.434	22	20	49.7	29.90	0.232 9788	46.0	5.00	5.15	...
4	16	50	56.96	13.473	22	32	27.3	28.23	0.232 8630	50.4	5.00	5.15	0 1.0
5	16	56	20.73	13.508	22	43	24.6	26.54	0.232 7368	54.8	5.00	5.15	0 2.5
6	17	1	45.34	+13.542	-22	53	41.0	-24.83	0.232 6001	- 59.1	5.00	5.15	0 3.9
7	17	7	10.73	13.574	23	3	16.1	23.09	0.232 4530	63.5	5.00	5.15	0 5.4
8	17	12	36.86	13.604	23	12	9.4	21.25	0.232 2955	67.8	5.00	5.15	0 6.9
9	17	18	3.68	13.631	23	20	20.6	19.58	0.232 1277	72.0	5.01	5.16	0 8.4
10	17	23	31.12	13.656	23	27	49.2	17.80	0.231 9497	76.3	5.01	5.16	0 9.9
11	17	28	59.14	+13.679	-23	34	34.8	-16.00	0.231 7616	- 80.5	5.01	5.16	0 11.4
12	17	34	27.67	13.699	23	40	37.2	14.19	0.231 5634	84.7	5.01	5.16	0 13.0
13	17	39	56.66	13.717	23	45	56.0	12.37	0.231 3551	88.8	5.02	5.17	0 14.5
14	17	45	26.05	13.732	23	50	31.0	10.54	0.231 1370	92.9	5.02	5.17	0 16.1
15	17	50	55.78	13.745	23	54	22.0	8.70	0.230 9090	97.0	5.02	5.17	0 17.6
16	17	56	25.79	+13.755	-23	57	28.6	- 6.85	0.230 6713	-101.0	5.02	5.17	0 19.2
17	18	1	56.02	13.763	23	59	50.8	5.00	0.230 4240	105.1	5.03	5.18	0 20.7
18	18	7	26.40	13.768	24	1	28.5	3.14	0.230 1670	109.1	5.03	5.18	0 22.3
19	18	12	56.87	13.771	24	2	21.4	- 1.27	0.229 9003	113.1	5.03	5.18	0 23.9
20	18	18	27.38	13.771	24	2	29.6	+ 0.59	0.229 6240	117.1	5.04	5.19	0 25.5
21	18	23	57.86	+13.768	-24	1	53.0	+ 2.46	0.229 3380	-121.2	5.04	5.19	0 27.0
22	18	29	28.23	13.763	24	0	31.5	4.33	0.229 0422	125.3	5.04	5.19	0 28.6
23	18	34	58.45	13.755	23	58	25.3	6.19	0.228 7365	129.4	5.05	5.20	0 30.1
24	18	40	28.44	13.744	23	55	34.5	8.05	0.228 4210	133.5	5.05	5.20	0 31.7
25	18	45	58.15	13.731	23	51	59.0	9.90	0.228 0956	137.7	5.05	5.20	0 33.3
26	18	51	27.50	+13.715	-23	47	39.2	+11.75	0.227 7601	-141.9	5.06	5.21	0 34.8
27	18	56	56.44	13.696	23	42	35.0	13.59	0.227 4145	146.1	5.06	5.21	0 36.3
28	19	2	24.90	13.675	23	36	46.9	15.42	0.227 0587	150.4	5.07	5.22	0 37.9
29	19	7	52.83	13.651	23	30	14.9	17.24	0.226 6926	154.7	5.07	5.22	0 39.4
30	19	13	20.15	13.625	23	22	59.5	19.05	0.226 3163	159.0	5.08	5.23	0 40.9
31	19	18	46.82	+13.597	-23	15	0.8	+20.84	0.225 9295	-163.3	5.08	5.23	0 42.4
32	19	24	12.78	+13.566	-23	6	19.3	+22.62	0.225 5322	-167.7	5.09	5.24	0 43.9

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Jan.	0	74 47 7.4	1 36 42.3	-0 7.3	-0 4 7.4	+5 44.0	9.857 6596	-687
	2	78 0 35.5	1 36 45.9	+0 13.1	+0 7 20.9	5 44.0	9.857 5250	680
	4	81 14 10.8	1 36 49.4	0 33.3	0 18 48.2	5 43.0	9.857 3961	630
	6	84 27 53.3	1 36 53.0	0 53.1	0 30 12.3	5 40.9	9.857 2732	596
	8	87 41 42.9	1 36 56.6	1 12.3	0 41 31.0	5 37.7	9.857 1569	565
	10	90 55 39.5	1 37 0.0	+1 30.5	+0 52 42.2	+5 33.3	9.857 0474	-530
	12	94 9 42.9	1 37 3.4	1 47.6	1 3 43.6	5 27.9	9.856 9452	492
	14	97 23 52.9	1 37 6.6	2 3.3	1 14 33.1	5 21.4	9.856 8505	454
	16	100 38 9.4	1 37 9.8	2 17.5	1 25 8.6	5 13.9	9.856 7637	414
	18	103 52 32.1	1 37 12.9	2 29.9	1 35 28.1	5 5.4	9.856 6851	372
	20	107 7 0.8	1 37 15.8	+2 40.4	+1 45 29.5	+4 55.9	9.856 6149	-330
	22	110 21 35.0	1 37 18.4	2 48.9	1 55 10.9	4 45.3	9.856 5533	286
	24	113 36 14.5	1 37 20.9	2 55.2	2 4 30.2	4 33.8	9.856 5007	241
	26	116 50 58.8	1 37 23.3	2 59.2	2 13 25.7	4 21.5	9.856 4570	196
	28	120 5 47.5	1 37 25.4	3 1.0	2 21 55.6	4 8.3	9.856 4225	149
	30	123 20 40.2	1 37 27.2	+3 0.4	+2 29 58.3	+3 54.2	9.856 3974	-102
Feb.	1	126 35 36.2	1 37 28.8	2 57.5	2 37 32.1	3 39.4	9.856 3817	55
	3	129 50 35.1	1 37 30.1	2 52.3	2 44 35.6	3 24.0	9.856 3754	- 8
	5	133 5 36.4	1 37 31.1	2 44.9	2 51 7.4	3 7.8	9.856 3786	+ 40
	7	136 20 39.3	1 37 31.8	2 35.4	2 57 6.2	2 51.0	9.856 3912	87
	9	139 35 43.2	1 37 32.1	+2 23.9	+3 2 30.8	+2 33.6	9.856 4133	+134
	11	142 50 47.6	1 37 32.2	2 10.6	3 7 20.2	2 15.8	9.856 4447	180
	13	146 5 51.8	1 37 31.9	1 55.5	3 11 33.5	1 57.5	9.856 4854	226
	15	149 20 55.0	1 37 31.2	1 39.0	3 15 9.8	1 38.8	9.856 5351	271
	17	152 35 56.5	1 37 30.2	1 21.2	3 18 8.4	1 19.8	9.856 5937	315
	19	155 50 55.7	1 37 28.9	+1 2.4	+3 20 28.9	+1 0.6	9.856 6610	+358
	21	159 5 51.7	1 37 27.1	0 42.8	3 22 10.7	0 41.2	9.856 7369	400
	23	162 20 44.0	1 37 25.1	0 22.6	3 23 13.5	0 21.6	9.856 8210	441
	25	165 35 31.9	1 37 22.7	+0 2.2	3 23 37.3	+0 2.1	9.856 9131	480
	27	168 50 14.6	1 37 20.0	-0 18.2	3 23 22.0	-0 17.4	9.857 0129	518
Mar.	1	172 4 51.5	1 37 16.9	-0 38.4	+3 22 27.7	-0 36.9	9.857 1201	+554
	3	175 19 22.0	1 37 13.5	0 58.2	3 20 54.6	0 56.2	9.857 2342	588
	5	178 33 45.4	1 37 9.8	1 17.1	3 18 43.1	1 15.3	9.857 3550	620
	7	181 48 1.1	1 37 5.9	1 35.1	3 15 53.7	1 34.1	9.857 4820	650
	9	185 2 8.7	1 37 1.7	1 51.8	3 12 26.9	1 52.6	9.857 6148	678
	11	188 16 7.6	1 36 57.2	-2 7.1	+3 8 23.6	-2 10.6	9.857 7529	+703
	13	191 29 57.4	1 36 52.5	2 20.8	3 3 44.6	2 28.3	9.857 8960	737
	15	194 43 37.6	1 36 47.7	2 32.7	2 58 30.9	2 45.4	9.858 0435	748
	17	197 57 7.9	1 36 42.6	2 42.7	2 52 43.5	3 1.9	9.858 1950	767
	19	201 10 27.8	1 36 37.4	2 50.6	2 46 23.6	3 17.9	9.858 3500	783
	21	204 23 37.3	1 36 32.1	-2 56.3	+2 39 32.4	-3 33.2	9.858 5080	+797
	23	207 36 36.1	1 36 26.7	2 59.8	2 32 11.5	3 47.7	9.858 6685	808
	25	210 49 24.0	1 36 21.2	3 1.0	2 24 22.2	4 1.5	9.858 8310	816
	27	214 2 0.9	1 36 15.7	3 0.0	2 16 6.0	4 14.5	9.858 9949	822
	29	217 14 26.8	1 36 10.2	2 56.7	2 7 24.7	4 26.7	9.859 1598	826
Apr.	31	220 26 41.7	1 36 4.7	-2 51.2	+1 58 19.9	-4 38.0	9.859 3252	+837
	2	223 38 45.6	1 35 59.3	-2 43.6	+1 48 53.4	-4 48.4	9.859 4904	+825

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	" ' "	" "	" ' "	" "		
r.	2	223 38 45.6	1 35 59.3	-2 43.6	+1 48 53.4	-4 48.4	9.859 4904	+835
	4	226 50 38.9	1 35 54.0	2 33.9	1 39 6.9	4 57.9	9.859 6550	821
	6	230 2 21.5	1 35 48.7	2 22.4	1 29 2.4	5 6.4	9.859 8186	814
	8	233 13 53.7	1 35 43.6	2 9.0	1 18 41.8	5 14.0	9.859 9805	805
	10	236 25 15.8	1 35 38.6	1 54.1	1 8 7.0	5 20.6	9.860 1403	798
	12	239 36 28.1	1 35 33.8	-1 37.8	+0 57 20.0	-5 26.3	9.860 2975	+779
	14	242 47 31.0	1 35 29.1	1 20.3	0 46 22.9	5 30.8	9.860 4516	762
	16	245 58 24.8	1 35 24.7	1 1.8	0 35 17.6	5 34.3	9.860 6022	743
	18	249 9 10.1	1 35 20.6	0 42.6	0 24 6.3	5 36.3	9.860 7487	722
	20	252 19 47.2	1 35 16.6	0 22.8	0 12 50.9	5 38.3	9.860 8908	696
	22	255 30 16.6	1 35 12.9	-0 2.8	+0 1 33.7	-5 38.8	9.861 0279	+673
	24	258 40 39.0	1 35 9.5	+0 17.3	-0 9 43.5	5 38.2	9.861 1598	645
	26	261 50 54.8	1 35 6.4	0 37.1	0 20 58.4	5 36.6	9.861 2859	616
	28	265 1 4.6	1 35 3.5	0 56.4	0 32 9.1	5 34.0	9.861 4060	585
	30	268 11 8.9	1 35 0.9	1 15.1	0 43 13.5	5 30.3	9.861 5196	551
y	2	271 21 8.3	1 34 58.6	+1 32.8	-0 54 9.7	-5 25.7	9.861 6264	+516
	4	274 31 3.5	1 34 56.6	1 49.4	1 4 55.7	5 20.1	9.861 7260	480
	6	277 40 54.9	1 34 54.9	2 4.6	1 15 29.5	5 13.5	9.861 8183	443
	8	280 50 43.3	1 34 53.5	2 18.4	1 25 49.3	5 6.0	9.861 9030	403
	10	284 0 29.1	1 34 52.4	2 30.4	1 35 53.1	4 57.6	9.861 9796	363
	12	287 10 12.9	1 34 51.5	+2 40.6	-1 45 39.3	-4 48.4	9.862 0481	+322
	14	290 19 55.3	1 34 50.9	2 48.8	1 55 6.0	4 38.2	9.862 1083	280
	16	293 29 36.8	1 34 50.6	2 55.0	2 4 11.5	4 27.3	9.862 1599	236
	18	296 39 18.0	1 34 50.6	2 59.0	2 12 54.2	4 15.4	9.862 2028	192
	20	299 48 59.3	1 34 50.8	3 0.9	2 21 12.6	4 2.8	9.862 2368	148
	22	302 58 41.3	1 34 51.2	+3 0.6	-2 29 5.1	-3 49.6	9.862 2620	+104
	24	306 8 24.4	1 34 51.9	2 58.0	2 36 30.5	3 35.6	9.862 2782	58
	26	309 18 9.1	1 34 52.8	2 53.3	2 43 27.2	3 21.0	9.862 2853	+ 13
	28	312 27 55.7	1 34 53.9	2 46.6	2 49 54.2	3 5.8	9.862 2833	- 33
	30	315 37 44.7	1 34 55.1	2 37.7	2 55 50.1	2 50.0	9.862 2722	78
ne	1	318 47 36.4	1 34 56.6	+2 26.9	-3 1 13.9	-2 33.7	9.862 2521	-123
	3	321 57 31.2	1 34 58.2	2 14.4	3 6 4.7	2 17.0	9.862 2231	168
	5	325 7 29.3	1 35 0.0	2 0.2	3 10 21.5	1 59.8	9.862 1851	212
	7	328 17 31.2	1 35 1.9	1 44.6	3 14 3.5	1 42.3	9.862 1384	255
	9	331 27 37.0	1 35 4.0	1 27.6	3 17 10.1	1 24.4	9.862 0830	298
	11	334 37 47.1	1 35 6.1	+1 9.6	-3 19 40.7	-1 6.3	9.862 0192	-340
	13	337 48 1.6	1 35 8.4	0 50.7	3 21 34.7	0 47.8	9.861 9471	381
	15	340 58 20.7	1 35 10.7	0 31.2	3 22 51.8	0 29.3	9.861 8609	421
	17	344 8 44.5	1 35 13.2	+0 11.4	3 23 31.7	-0 10.6	9.861 7788	460
	19	347 19 13.4	1 35 15.7	-0 8.7	3 23 34.2	+0 8.1	9.861 6831	497
	21	350 29 47.3	1 35 18.3	-0 28.6	-3 22 59.3	+0 26.8	9.861 5802	-532
	23	353 40 26.6	1 35 21.0	0 48.2	3 21 46.9	0 45.5	9.861 4703	566
	25	356 51 11.2	1 35 23.7	1 7.2	3 19 57.4	1 4.0	9.861 3537	599
	27	0 2 1.3	1 35 26.4	1 25.4	3 17 31.0	1 22.4	9.861 2307	630
	29	3 12 57.0	1 35 29.2	1 42.6	3 14 28.0	1 40.6	9.861 1018	659
	1	6 23 58.3	1 35 32.1	-1 58.5	-3 10 49.0	+1 58.4	9.860 9674	-685
	3	9 35 5.5	1 35 35.0	-2 12.9	-3 6 34.6	+2 16.0	9.860 8279	-715

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Val D
July	1	6 23 58.3	1 35 32.1	-1 58.5	-3 10 49.0	+1 58.4	9.880 9674	-
	3	9 35 5.5	1 35 35.0	2 12.9	3 6 34.6	2 16.0	9.860 8279	-
	5	12 46 18.5	1 35 38.0	2 25.7	3 1 45.4	2 33.1	9.860 6836	-
	7	15 57 37.4	1 35 41.0	2 36.8	2 56 22.4	2 49.3	9.860 5350	-
	9	19 9 2.4	1 35 44.0	2 45.8	2 50 26.3	3 6.1	9.860 3825	-
	11	22 20 33.5	1 35 47.1	-2 52.9	-2 43 58.3	+3 21.8	9.860 2267	-
	13	25 32 10.7	1 35 50.2	2 57.8	2 36 59.6	3 36.8	9.860 0680	-
	15	28 43 54.3	1 35 53.4	3 0.5	2 29 31.3	3 51.3	9.859 9069	-
	17	31 55 44.2	1 35 56.5	3 0.9	2 21 34.8	4 5.1	9.859 7438	-
	19	35 7 40.5	1 35 59.8	2 59.1	2 13 11.5	4 18.1	9.859 5794	-
	21	38 19 43.3	1 36 3.1	-2 55.1	-2 4 22.9	+4 30.3	9.859 4141	-
	23	41 31 52.8	1 36 6.4	2 48.9	1 55 10.7	4 41.8	9.859 2484	-
	25	44 44 8.9	1 36 9.7	2 40.5	1 45 36.4	4 52.4	9.859 0829	-
	27	47 56 31.8	1 36 13.2	2 30.2	1 35 41.8	5 2.0	9.858 9180	-
	29	51 9 1.6	1 36 16.6	2 17.9	1 25 28.9	5 10.8	9.858 7543	-
	31	54 21 38.2	1 36 20.1	-2 3.9	-1 14 59.4	+5 18.6	9.858 5924	-
Aug.	2	57 34 22.0	1 36 23.7	1 48.4	1 4 15.2	5 25.4	9.858 4326	-
	4	60 47 12.8	1 36 27.2	1 31.4	0 53 18.5	5 31.1	9.858 2756	-
	6	64 0 10.7	1 36 30.7	1 13.4	0 42 11.3	5 35.9	9.858 1218	-
	8	67 13 15.7	1 36 34.3	0 54.3	0 30 55.6	5 39.6	9.857 9718	-
	10	70 26 28.0	1 36 38.0	-0 34.6	-0 19 33.6	+5 42.2	9.857 8259	-
	12	73 39 47.6	1 36 41.6	-0 14.4	-0 8 7.4	5 43.8	9.857 6848	-
	14	76 53 14.4	1 36 45.2	+0 6.0	+0 3 20.7	5 44.2	9.857 5488	-
	16	80 6 48.4	1 36 48.8	0 26.3	0 14 48.6	5 43.6	9.857 4183	-
	18	83 20 29.6	1 36 52.4	0 46.2	0 26 14.2	5 41.8	9.857 2938	-
	20	86 34 17.8	1 36 55.9	+1 5.7	+0 37 35.1	+5 38.9	9.857 1758	-
	22	89 48 13.1	1 36 59.3	1 24.2	0 48 49.2	5 35.0	9.857 0645	-
	24	93 2 15.1	1 37 2.7	1 41.8	0 59 54.3	5 30.0	9.856 9605	-
Sept.	26	96 16 23.8	1 37 6.0	1 58.0	1 10 48.3	5 23.8	9.856 8639	-
	28	99 30 39.0	1 37 9.3	2 12.7	1 21 29.0	5 16.7	9.856 7752	-
	30	102 45 0.4	1 37 12.3	+2 25.8	+1 31 54.3	+5 8.5	9.856 6945	-
	1	105 59 27.9	1 37 15.2	2 37.0	1 42 2.2	4 59.2	9.856 6222	-
	3	109 14 1.0	1 37 17.9	2 46.2	1 51 50.7	4 49.1	9.856 5585	-
	5	112 28 39.4	1 37 20.5	2 53.2	2 1 18.0	4 38.0	9.856 5036	-
	7	115 43 22.8	1 37 22.8	2 58.0	2 10 22.0	4 25.9	9.856 4578	-
	9	118 58 10.6	1 37 24.9	+3 0.6	+2 19 1.0	+4 13.0	9.856 4211	-
	11	122 13 2.4	1 37 26.8	3 0.8	2 27 13.4	3 59.2	9.856 3937	-
	13	125 27 57.8	1 37 28.5	2 58.8	2 34 57.4	3 44.7	9.856 3756	-
	15	128 42 56.2	1 37 29.9	2 54.4	2 42 11.7	3 29.4	9.856 3670	-
	17	131 57 57.1	1 37 31.0	2 47.7	2 48 54.6	3 13.4	9.856 3679	+
	19	135 12 59.9	1 37 31.7	+2 39.0	+2 55 5.1	+2 56.9	9.856 3782	+
	21	138 28 3.8	1 37 32.1	2 28.2	3 0 41.7	2 39.7	9.856 3979	+
	23	141 43 8.3	1 37 32.3	2 15.4	3 5 43.5	2 22.0	9.856 4269	+
	25	144 58 12.8	1 37 32.1	2 1.0	3 10 9.4	2 3.9	9.856 4652	+
	27	148 13 16.6	1 37 31.6	1 44.9	3 13 58.7	1 45.3	9.856 5126	+
Oct.	29	151 28 18.9	1 37 30.7	+1 27.6	+3 17 10.5	+1 26.4	9.856 5690	+
	1	154 43 19.0	1 37 29.4	+1 9.1	+3 19 44.3	+1 7.3	9.856 6341	+

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	" ' "	" "	" ' "	" "		
st.	1	154 43 19.0	1 37 29.4	+1 9.1	+3 19 44.3	+1 7.3	9.856 6341	+347
	3	157 58 16.2	1 37 27.8	0 49.7	3 21 39.6	0 48.0	9.856 7078	389
	5	161 13 10.0	1 37 25.9	0 29.5	3 22 56.1	0 28.5	9.856 7898	431
	7	164 27 59.4	1 37 23.5	+0 9.4	3 23 33.5	+0 8.9	9.856 8799	470
	9	167 42 43.9	1 37 20.9	-0 11.1	3 23 31.8	-0 10.6	9.856 9777	508
	11	170 57 22.8	1 37 17.9	-0 31.5	+3 22 51.1	-0 30.1	9.857 0829	+544
	13	174 11 55.4	1 37 14.6	0 51.4	3 21 31.5	0 49.5	9.857 1952	579
	15	177 26 21.2	1 37 11.1	1 10.6	3 19 33.3	1 8.6	9.857 3142	611
	17	180 40 39.5	1 37 7.2	1 29.0	3 16 57.1	1 27.6	9.857 4395	642
	19	183 54 49.9	1 37 3.1	1 46.1	3 13 43.2	1 46.2	9.857 5707	670
	21	187 8 51.6	1 36 58.7	-2 2.0	+3 9 52.6	-2 4.4	9.857 7075	+697
	23	190 22 44.4	1 36 54.1	2 16.3	3 5 25.9	2 22.2	9.857 8493	721
	25	193 36 27.7	1 36 49.2	2 28.8	3 0 24.2	2 39.5	9.857 9957	742
	27	196 50 1.2	1 36 44.2	2 39.4	2 54 48.4	2 56.2	9.858 1461	762
	29	200 3 24.5	1 36 39.0	2 48.0	2 48 39.7	3 12.4	9.858 3003	779
	31	203 16 37.3	1 36 33.8	-2 54.5	+2 41 59.4	-3 27.9	9.858 4575	+798
sv.	2	206 29 39.6	1 36 28.4	2 58.8	2 34 48.7	3 42.7	9.858 6174	805
	4	209 42 30.9	1 36 22.9	3 0.8	2 27 9.2	3 56.7	9.858 7795	815
	6	212 55 11.3	1 36 17.4	3 0.6	2 19 2.3	4 10.0	9.858 9432	822
	8	216 7 40.7	1 36 12.0	2 58.1	2 10 29.6	4 22.5	9.859 1080	826
	10	219 19 59.2	1 36 6.5	-2 53.4	+2 1 32.8	-4 34.2	9.859 2734	+827
	12	222 32 6.7	1 36 1.0	2 46.5	1 52 13.6	4 44.9	9.859 4388	827
	14	225 44 3.3	1 35 55.6	2 37.5	1 42 33.9	4 54.7	9.859 6039	824
	16	228 55 49.2	1 35 50.3	2 26.6	1 32 35.5	5 3.6	9.859 7680	817
	18	232 7 24.7	1 35 45.2	2 13.9	1 22 20.3	5 11.5	9.859 9306	808
	20	235 18 50.0	1 35 40.1	-1 59.5	+1 11 50.3	-5 18.4	9.860 0911	+797
	22	238 30 5.3	1 35 35.2	1 43.6	1 1 7.4	5 24.4	9.860 2493	784
	24	241 41 11.1	1 35 30.6	1 26.5	0 50 13.6	5 29.3	9.860 4045	768
	26	244 52 7.7	1 35 26.1	1 8.4	0 39 11.0	5 33.2	9.860 5563	750
	28	248 2 55.6	1 35 21.8	0 49.4	0 28 1.6	5 36.1	9.860 7042	729
	30	251 13 35.2	1 35 17.8	-0 29.7	+0 16 47.4	-5 37.9	9.860 8478	+706
ec.	2	254 24 7.0	1 35 14.0	-0 9.8	+0 5 30.6	5 38.7	9.860 9866	682
	4	257 34 31.5	1 35 10.5	+0 10.3	-0 5 46.8	5 38.5	9.861 1203	655
	6	260 44 49.3	1 35 7.2	0 30.2	0 17 2.8	5 37.3	9.861 2483	626
	8	263 55 0.8	1 35 4.2	0 49.8	0 28 15.2	5 35.0	9.861 3704	595
	10	267 5 6.7	1 35 1.6	+1 8.7	-0 39 22.0	-5 31.7	9.861 4862	+563
	12	270 15 7.5	1 34 59.2	1 26.7	0 50 21.3	5 27.4	9.861 5953	528
	14	273 25 3.8	1 34 57.2	1 43.7	1 1 11.1	5 22.2	9.861 6974	493
	16	276 34 56.3	1 34 55.4	1 59.5	1 11 49.4	5 15.9	9.861 7922	455
	18	279 44 45.4	1 34 53.8	2 13.8	1 22 14.2	5 8.8	9.861 8793	416
	20	282 54 31.8	1 34 52.6	+2 26.4	-1 32 23.8	-5 0.7	9.861 9586	+376
	22	286 4 16.0	1 34 51.6	2 37.2	1 42 16.3	4 51.7	9.862 0298	335
	24	289 13 58.6	1 34 51.0	2 46.2	1 51 50.0	4 41.8	9.862 0927	293
	26	292 23 40.2	1 34 50.7	2 53.1	2 1 3.1	4 31.1	9.862 1471	251
	28	295 33 21.3	1 34 50.5	2 57.9	2 9 53.9	4 19.6	9.862 1929	207
	30	298 43 2.3	1 34 50.6	+3 0.5	-2 18 21.0	-4 7.4	9.862 2299	+163
	32	301 52 43.8	1 34 50.9	+3 0.9	-2 26 22.8	-3 54.3	9.862 2580	+118

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	M
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	" ' "	"			"	"	
Jan. 1	11 54 6.11	+2.997	+3 35 9.1	-15.90	0.055 3635	-1506.4	4.45	7.75	1
2	11 55 17.30	2.936	3 28 52.4	15.49	0.051 7360	1516.5	4.48	7.81	1
3	11 56 27.01	2.873	3 22 45.8	15.06	0.048 0844	1526.5	4.52	7.88	1
4	11 57 35.19	2.809	3 16 49.7	14.62	0.044 4091	1536.2	4.56	7.94	1
5	11 58 41.82	2.743	3 11 4.2	14.17	0.040 7107	1545.8	4.60	8.01	1
6	11 59 46.85	+2.676	+3 5 29.6	-13.71	0.036 9894	-1555.2	4.64	8.08	1
7	12 0 50.26	2.607	3 0 6.1	13.24	0.033 2458	1564.4	4.68	8.15	1
8	12 1 52.00	2.537	2 54 54.1	12.76	0.029 4805	1573.3	4.72	8.22	1
9	12 2 52.03	2.465	2 49 53.7	12.27	0.025 6942	1581.9	4.76	8.29	1
10	12 3 50.32	2.392	2 45 5.2	11.77	0.021 8876	1590.2	4.80	8.37	1
11	12 4 46.82	+2.316	+2 40 28.8	-11.26	0.018 0615	-1598.1	4.84	8.44	1
12	12 5 41.50	2.240	2 36 4.8	10.74	0.014 2168	1605.7	4.89	8.52	1
13	12 6 34.31	2.161	2 31 53.4	10.21	0.010 3545	1612.8	4.93	8.59	1
14	12 7 25.22	2.081	2 27 54.7	9.67	0.006 4756	1619.5	4.98	8.67	1
15	12 8 14.19	2.000	2 24 9.1	9.12	0.002 5811	1625.8	5.02	8.75	1
16	12 9 1.19	+1.917	+2 20 36.7	-8.57	9.998 6721	-1631.7	5.07	8.83	1
17	12 9 46.18	1.832	2 17 17.6	8.01	9.994 7495	1637.1	5.11	8.91	1
18	12 10 29.13	1.746	2 14 12.1	7.45	9.990 8146	1642.0	5.16	8.99	1
19	12 11 9.99	1.659	2 11 20.3	6.87	9.986 8685	1646.4	5.21	9.07	1
20	12 11 48.74	1.570	2 8 42.5	6.28	9.982 9123	1650.4	5.25	9.15	1
21	12 12 25.33	+1.479	+2 6 18.9	-5.69	9.978 9472	-1653.8	5.30	9.24	1
22	12 12 59.73	1.387	2 4 9.6	5.09	9.974 9745	1656.7	5.35	9.32	1
23	12 13 31.89	1.293	2 2 14.9	4.47	9.970 9956	1659.0	5.40	9.41	1
24	12 14 1.78	1.197	2 0 35.0	3.85	9.967 0117	1660.8	5.45	9.49	1
25	12 14 29.36	1.100	1 59 10.2	3.22	9.963 0242	1662.0	5.50	9.58	1
26	12 14 54.58	+1.001	+1 58 0.6	-2.58	9.959 0348	-1662.5	5.55	9.67	1
27	12 15 17.40	0.900	1 57 6.5	1.93	9.955 0449	1662.3	5.60	9.76	1
28	12 15 37.78	0.798	1 56 28.0	1.27	9.951 0564	1661.4	5.65	9.85	1
29	12 15 55.68	0.693	1 56 5.5	-0.60	9.947 0710	1659.6	5.71	9.94	1
30	12 16 11.04	0.587	1 55 59.0	+0.07	9.943 0908	1657.0	5.76	10.03	1
31	12 16 23.83	+0.479	+1 56 8.7	+0.75	9.939 1179	-1653.6	5.81	10.12	1
Feb. 1	12 16 34.01	0.369	1 56 34.9	1.44	9.935 1545	1649.1	5.87	10.22	1
2	12 16 41.53	0.257	1 57 17.7	2.13	9.931 2030	1643.7	5.92	10.31	1
3	12 16 46.35	0.144	1 58 17.3	2.84	9.927 2657	1637.2	5.97	10.40	1
4	12 16 48.43	+0.029	1 59 33.8	3.54	9.923 3453	1629.6	6.03	10.50	1
5	12 16 47.74	-0.088	+2 1 7.4	+4.26	9.919 4447	-1620.7	6.08	10.59	1
6	12 16 44.23	0.206	2 2 58.2	4.97	9.915 5667	1610.7	6.14	10.69	1
7	12 16 37.88	0.325	2 5 6.2	5.69	9.911 7144	1599.4	6.19	10.78	1
8	12 16 28.65	0.445	2 7 31.5	6.41	9.907 8909	1586.7	6.25	10.88	1
9	12 16 16.53	0.566	2 10 14.1	7.14	9.904 0996	1572.5	6.30	10.97	1
10	12 16 1.49	-0.688	+2 13 14.0	+7.85	9.900 3440	-1556.9	6.35	11.07	1
11	12 15 43.50	0.810	2 16 31.0	8.56	9.896 6278	1539.7	6.41	11.17	1
12	12 15 22.62	0.933	2 20 5.1	9.27	9.892 9546	1521.0	6.46	11.26	1
13	12 14 58.72	1.056	2 23 56.2	9.98	9.889 3281	1500.8	6.51	11.35	1
14	12 14 31.90	1.179	2 28 4.0	10.67	9.885 7520	1479.0	6.57	11.45	1
15	12 14 2.13	-1.301	+2 32 28.3	+11.36	9.882 2301	-1455.6	6.62	11.54	1
16	12 13 29.43	-1.424	+2 37 9.1	+12.04	9.878 7662	-1430.7	6.68	11.63	1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.			
	h	m	s		°	'	"									
	h	m	s	s	°	'	"	"					h	m		
ib.	16	12	13	29.43	-1.424	+2	37	9.1	+12.04	9.878 7662	-1430.7	6.68	11.63	14	28.1	
	17	12	12	53.81	1.545	2	42	5.9	12.70	9.875 3640	1404.2	6.73	11.73	14	23.5	
	18	12	12	15.29	1.665	2	47	18.5	13.35	9.872 0273	1376.1	6.78	11.82	14	18.9	
	19	12	11	33.89	1.785	2	52	46.6	13.99	9.868 7601	1346.4	6.83	11.90	14	14.3	
	20	12	10	49.64	1.902	2	58	29.7	14.61	9.865 5661	1315.0	6.88	11.99	14	9.6	
	21	12	10	2.58	-2.019	+3	4	27.6	+15.21	9.862 4493	-1282.0	6.93	12.08	14	4.9	
	22	12	9	12.74	2.134	3	10	39.8	15.80	9.859 4137	1247.4	6.98	12.16	14	0.1	
	23	12	8	20.16	2.247	3	17	5.9	16.37	9.856 4630	1211.2	7.03	12.25	13	55.2	
	24	12	7	24.88	2.359	3	23	45.4	16.92	9.853 6013	1173.3	7.08	12.33	13	50.4	
	25	12	6	26.96	2.467	3	30	37.8	17.44	9.850 8325	1133.7	7.12	12.41	13	45.5	
	26	12	5	26.46	-2.574	+3	37	42.5	+17.94	9.848 1606	-1092.5	7.16	12.48	13	40.5	
	27	12	4	23.45	2.677	3	44	58.8	18.41	9.845 5896	1049.7	7.21	12.56	13	35.5	
	28	12	3	17.99	2.777	3	52	26.2	18.86	9.843 1232	1005.3	7.25	12.63	13	30.5	
	far.	1	12	2	10.17	2.874	4	0	3.9	19.28	9.840 7654	959.2	7.29	12.70	13	25.4
		2	12	1	0.08	2.966	4	7	51.3	19.66	9.838 5200	911.6	7.32	12.76	13	20.3
	3	11	59	47.81	-3.066	+4	15	47.4	+20.01	9.836 3907	-862.5	7.36	12.83	13	15.1	
	4	11	58	33.45	3.140	4	23	51.5	20.32	9.834 3811	811.9	7.40	12.89	13	10.0	
	5	11	57	17.13	3.220	4	32	2.7	20.60	9.832 4949	759.8	7.43	12.94	13	4.8	
	6	11	55	58.94	3.295	4	40	20.0	20.84	9.830 7352	706.4	7.46	12.99	12	59.5	
	7	11	54	39.03	3.364	4	48	42.5	21.03	9.829 1052	651.7	7.48	13.04	12	54.2	
	8	11	53	17.51	-3.428	+4	57	9.3	+21.19	9.827 6078	-595.8	7.51	13.09	12	48.9	
	9	11	51	54.54	3.486	5	5	39.2	21.30	9.826 2461	538.7	7.54	13.13	12	43.6	
	10	11	50	30.25	3.537	5	14	11.1	21.36	9.825 0226	480.7	7.56	13.17	12	38.3	
	11	11	49	4.81	3.582	5	22	44.0	21.38	9.823 9395	421.6	7.58	13.20	12	32.9	
	12	11	47	38.37	3.620	5	31	16.8	21.35	9.822 9994	361.9	7.59	13.23	12	27.6	
	13	11	46	11.10	-3.651	+5	39	48.4	+21.27	9.822 2029	-301.8	7.60	13.25	12	22.2	
	14	11	44	43.18	3.675	5	48	17.5	21.15	9.821 5511	241.4	7.62	13.27	12	16.8	
	15	11	43	14.77	3.691	5	56	43.0	20.97	9.821 0445	180.8	7.63	13.29	12	11.4	
	16	11	41	46.06	3.700	6	5	3.9	20.76	9.820 6832	120.2	7.63	13.30	12	6.0	
	17	11	40	17.21	3.702	6	13	19.0	20.49	9.820 4674	-59.7	7.63	13.30	12	0.6	
	18	11	38	48.40	-3.697	+6	21	27.3	+20.19	9.820 3968	+0.8	7.64	13.31	11	55.2	
	19	11	37	19.80	3.685	6	29	27.9	19.85	9.820 4710	61.0	7.63	13.30	11	49.8	
	20	11	35	51.58	3.666	6	37	19.8	19.47	9.820 6893	120.7	7.63	13.30	11	44.4	
	21	11	34	23.90	3.640	6	45	2.0	19.05	9.821 0500	179.7	7.63	13.29	11	39.0	
	22	11	32	56.92	3.607	6	52	33.8	18.59	9.821 5514	238.0	7.62	13.27	11	33.6	
	23	11	31	30.80	-3.568	+6	59	54.1	+18.10	9.822 1918	+295.4	7.61	13.25	11	28.3	
	24	11	30	5.69	3.523	7	7	2.4	17.58	9.822 9687	351.9	7.59	13.23	11	23.0	
	25	11	28	41.74	3.472	7	13	57.8	17.03	9.823 8799	407.3	7.58	13.20	11	17.7	
	26	11	27	19.09	3.415	7	20	39.6	16.45	9.824 9231	461.8	7.56	13.17	11	12.4	
	27	11	25	57.89	3.351	7	27	7.1	15.84	9.826 0955	515.1	7.54	13.13	11	7.1	
	28	11	24	38.26	-3.284	+7	33	19.8	+15.21	9.827 3944	+567.1	7.51	13.09	11	1.9	
	29	11	23	20.32	3.210	7	39	17.0	14.56	9.828 8166	617.9	7.49	13.05	10	56.7	
	30	11	22	4.21	3.132	7	44	58.3	13.88	9.830 3590	667.2	7.47	13.01	10	51.5	
	31	11	20	50.03	3.049	7	50	23.2	13.19	9.832 0182	715.2	7.44	12.96	10	46.3	
	pr.	1	11	19	37.90	2.961	7	55	31.2	12.48	9.833 7906	761.6	7.41	12.90	10	41.2
		2	11	18	27.92	-2.870	+8	0	22.0	+11.75	9.835 6729	+806.7	7.38	12.85	10	36.1
		3	11	17	20.18	-2.774	+8	4	55.1	+11.01	9.837 6615	+850.2	7.34	12.79	10	31.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"			"	"	h	m
Apr.	1	11	19	37.90	-2.961	+7	55	31.2	+12.48	9.833 7906	+ 761.6	7.41	12.90	10 41.2
	2	11	18	27.92	2.870	8	0	22.0	11.75	9.835 6729	806.7	7.38	12.85	10 36.1
	3	11	17	20.18	2.774	8	4	55.1	11.01	9.837 6615	850.2	7.34	12.79	10 31.1
	4	11	16	14.78	2.675	8	9	10.3	10.26	9.839 7527	892.2	7.31	12.73	10 26.1
	5	11	15	11.81	2.572	8	13	7.4	9.50	9.841 9428	932.6	7.27	12.66	10 21.1
	6	11	14	11.34	-2.466	+8	16	46.0	+ 8.72	9.844 2279	+ 971.4	7.23	12.60	10 16.2
	7	11	13	13.47	2.356	8	20	5.9	7.94	9.846 6043	1008.6	7.19	12.53	10 11.3
	8	11	12	18.25	2.245	8	23	6.9	7.15	9.849 0679	1044.2	7.15	12.46	10 6.5
	9	11	11	25.75	2.130	8	25	48.9	6.35	9.851 6150	1078.0	7.11	12.38	10 1.7
	10	11	10	36.03	2.013	8	28	11.9	5.56	9.854 2410	1110.1	7.07	12.31	9 57.0
	11	11	9	49.14	-1.894	+8	30	15.7	+ 4.76	9.856 9420	+1140.4	7.02	12.23	9 52.3
	12	11	9	5.12	1.774	8	32	0.3	3.96	9.859 7137	1169.0	6.98	12.16	9 47.7
	13	11	8	24.01	1.652	8	33	25.7	3.16	9.862 5518	1195.8	6.93	12.08	9 43.1
	14	11	7	45.84	1.529	8	34	32.1	2.37	9.865 4523	1220.9	6.89	12.00	9 38.6
	15	11	7	10.62	1.406	8	35	19.5	1.58	9.868 4109	1244.3	6.84	11.91	9 34.1
	16	11	6	38.37	-1.282	+8	35	48.1	+ 0.80	9.871 4238	+1266.1	6.79	11.83	9 29.6
	17	11	6	9.09	1.158	8	35	58.1	+ 0.03	9.874 4869	1286.2	6.74	11.75	9 25.2
	18	11	5	42.78	1.035	8	35	49.7	- 0.73	9.877 5966	1304.9	6.69	11.66	9 20.9
	19	11	5	19.43	0.912	8	35	23.1	1.49	9.880 7492	1322.0	6.65	11.58	9 16.6
	20	11	4	59.02	0.789	8	34	38.5	2.23	9.883 9413	1337.8	6.60	11.50	9 12.3
	21	11	4	41.54	-0.667	+8	33	36.2	- 2.96	9.887 1695	+1352.2	6.55	11.41	9 8.1
	22	11	4	26.98	0.546	8	32	16.5	3.68	9.890 4307	1365.3	6.50	11.33	9 3.9
	23	11	4	15.31	0.426	8	30	39.5	4.39	9.893 7218	1377.1	6.45	11.24	8 59.8
	24	11	4	6.51	0.307	8	28	45.7	5.09	9.897 0398	1387.7	6.40	11.15	8 55.8
	25	11	4	0.55	0.190	8	26	35.3	5.78	9.900 3820	1397.2	6.35	11.07	8 51.8
	26	11	3	57.40	-0.073	+8	24	8.5	- 6.45	9.903 7457	+1405.7	6.30	10.98	8 47.8
	27	11	3	57.02	+0.041	8	21	25.5	7.12	9.907 1285	1413.1	6.26	10.90	8 43.9
	28	11	3	59.37	0.154	8	18	26.6	7.78	9.910 5279	1419.6	6.20	10.81	8 40.0
	29	11	4	4.42	0.266	8	15	12.1	8.43	9.913 9417	1425.1	6.15	10.73	8 36.2
	30	11	4	12.14	0.377	8	11	42.2	9.06	9.917 3678	1429.8	6.11	10.64	8 32.4
May	1	11	4	22.49	+0.486	+8	7	57.2	- 9.69	9.920 8041	+1433.6	6.06	10.56	8 28.6
	2	11	4	35.44	0.593	8	3	57.3	10.30	9.924 2487	1436.7	6.02	10.48	8 24.9
	3	11	4	50.95	0.699	7	59	42.9	10.90	9.927 6997	1439.0	5.96	10.39	8 21.3
	4	11	5	8.99	0.804	7	55	14.1	11.50	9.931 1555	1440.6	5.92	10.31	8 17.7
	5	11	5	29.52	0.907	7	50	31.1	12.08	9.934 6142	1441.5	5.87	10.23	8 14.1
	6	11	5	52.51	+1.009	+7	45	34.2	-12.66	9.938 0741	+1441.7	5.83	10.15	8 10.6
	7	11	6	17.92	1.109	7	40	23.5	13.23	9.941 5338	1441.2	5.78	10.07	8 7.1
	8	11	6	45.71	1.207	7	34	59.3	13.79	9.944 9915	1440.1	5.73	9.99	8 3.6
	9	11	7	15.85	1.304	7	29	21.7	14.34	9.948 4456	1438.3	5.69	9.91	8 0.2
	10	11	7	48.29	1.399	7	23	31.1	14.88	9.951 8947	1435.9	5.64	9.83	7 56.8
	11	11	8	23.01	+1.493	+7	17	27.6	-15.41	9.955 3372	+1432.8	5.60	9.75	7 53.4
	12	11	8	59.96	1.585	7	11	11.4	15.93	9.958 7717	1429.2	5.56	9.68	7 50.1
	13	11	9	39.10	1.676	7	4	42.9	16.44	9.962 1968	1425.0	5.51	9.60	7 46.9
	14	11	10	20.39	1.764	6	58	2.3	16.94	9.965 6112	1420.3	5.47	9.53	7 43.6
	15	11	11	3.77	1.851	6	51	9.8	17.43	9.969 0137	1415.1	5.42	9.45	7 40.4
	16	11	11	49.21	+1.936	+6	44	5.7	-17.91	9.972 4034	+1409.5	5.38	9.38	7 37.3
	17	11	12	36.66	+2.019	+6	36	50.2	-18.38	9.975 7791	+1403.5	5.34	9.30	7 34.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.			
	Noon.				Noon.											
	h	m	s	s	°	'	"	"					h	m		
May	17	11	12	36.66	+2.019	+6	36	50.2	-18.38	9.975 7791	+1403.5	5.34	9.30	7	34.1	
	18	11	13	26.08	2.100	6	29	23.5	18.84	9.979 1401	1397.2	5.30	9.23	7	31.0	
	19	11	14	17.42	2.179	6	21	45.9	19.29	9.982 4855	1390.6	5.26	9.16	7	27.9	
	20	11	15	10.64	2.256	6	13	57.7	19.73	9.985 8146	1383.6	5.22	9.09	7	24.9	
	21	11	16	5.71	2.332	6	5	59.0	20.16	9.989 1268	1376.5	5.17	9.02	7	21.9	
	22	11	17	2.56	+2.406	+5	57	50.0	-20.59	9.992 4214	+1369.0	5.14	8.95	7	18.9	
	23	11	18	1.17	2.478	5	49	31.0	21.00	9.995 6980	1361.4	5.10	8.89	7	16.0	
	24	11	19	1.50	2.549	5	41	2.1	21.41	9.998 9561	1353.6	5.06	8.82	7	13.1	
	25	11	20	3.51	2.618	5	32	23.6	21.80	0.002 1953	1345.7	5.03	8.76	7	10.2	
	26	11	21	7.16	2.686	5	23	35.7	22.19	0.005 4152	1337.6	4.99	8.69	7	7.3	
	27	11	22	12.41	+2.752	+5	14	38.5	-22.57	0.008 6156	+1329.4	4.95	8.63	7	4.4	
	28	11	23	19.24	2.817	5	5	32.2	22.95	0.011 7962	1321.1	4.91	8.56	7	1.6	
	29	11	24	27.60	2.880	4	56	16.9	23.32	0.014 9568	1312.7	4.88	8.50	6	58.8	
	30	11	25	37.48	2.943	4	46	52.9	23.68	0.018 0972	1304.3	4.84	8.44	6	56.1	
	31	11	26	48.84	3.004	4	37	20.2	24.04	0.021 2173	1295.7	4.81	8.38	6	53.3	
	June	1	11	28	1.65	+3.064	+4	27	39.0	-24.39	0.024 3167	+1287.1	4.78	8.32	6	50.6
		2	11	29	15.89	3.123	4	17	49.4	24.74	0.027 3955	1278.5	4.74	8.26	6	47.9
		3	11	30	31.54	3.181	4	7	51.6	25.08	0.030 4533	1269.7	4.71	8.20	6	45.3
		4	11	31	48.57	3.238	3	57	45.6	25.41	0.033 4901	1260.9	4.68	8.15	6	42.6
		5	11	33	6.95	3.294	3	47	31.7	25.75	0.036 5055	1251.9	4.64	8.09	6	40.0
6		11	34	26.67	+3.349	+3	37	9.8	-26.07	0.039 4993	+1242.9	4.61	8.03	6	37.4	
7		11	35	47.70	3.403	3	26	40.3	26.39	0.042 4712	1233.7	4.58	7.98	6	34.8	
8		11	37	10.02	3.457	3	16	3.1	26.71	0.045 4211	1224.5	4.55	7.92	6	32.2	
9		11	38	33.61	3.509	3	5	18.5	27.01	0.048 3486	1215.1	4.52	7.87	6	29.7	
10		11	39	58.44	3.560	2	54	26.6	27.31	0.051 2536	1205.7	4.49	7.82	6	27.2	
	11	11	41	24.49	+3.610	+2	43	27.5	-27.60	0.054 1358	+1196.1	4.46	7.77	6	24.7	
	12	11	42	51.73	3.660	2	32	21.5	27.89	0.056 9950	1186.5	4.43	7.72	6	22.2	
	13	11	44	20.15	3.708	2	21	8.7	28.17	0.059 8312	1176.9	4.40	7.66	6	19.7	
	14	11	45	49.71	3.755	2	9	49.3	28.45	0.062 6442	1167.2	4.37	7.62	6	17.3	
	15	11	47	20.39	3.801	1	58	23.3	28.71	0.065 4340	1157.6	4.35	7.57	6	14.9	
	16	11	48	52.17	+3.847	+1	46	51.0	-28.98	0.068 2007	+1148.0	4.32	7.52	6	12.5	
	17	11	50	25.03	3.891	1	35	12.4	29.23	0.070 9443	1138.4	4.29	7.47	6	10.1	
	18	11	51	58.95	3.935	1	23	27.9	29.48	0.073 6648	1128.7	4.26	7.43	6	7.7	
	19	11	53	33.90	3.977	1	11	37.5	29.72	0.076 3623	1119.2	4.24	7.38	6	5.4	
	20	11	55	9.87	4.020	0	59	41.3	29.96	0.079 0369	1109.7	4.21	7.33	6	3.0	
	21	11	56	46.85	+4.061	+0	47	39.6	-30.19	0.081 6887	+1100.2	4.18	7.29	6	0.7	
	22	11	58	24.80	4.101	0	35	32.3	30.41	0.084 3178	1090.8	4.16	7.25	5	58.4	
	23	12	0	3.71	4.141	0	23	19.8	30.63	0.086 9244	1081.4	4.13	7.20	5	56.1	
	24	12	1	43.57	4.180	+0	11	2.1	30.85	0.089 5086	1072.1	4.11	7.16	5	53.9	
	25	12	3	24.36	4.219	-0	1	20.8	31.06	0.092 0708	1063.0	4.09	7.12	5	51.6	
	26	12	5	6.07	+4.257	-0	13	48.6	-31.26	0.094 6111	+1053.9	4.06	7.08	5	49.4	
	27	12	6	48.69	4.295	0	26	21.2	31.46	0.097 1297	1045.0	4.04	7.04	5	47.1	
	28	12	8	32.21	4.332	0	38	58.6	31.65	0.099 6270	1036.1	4.01	6.99	5	44.9	
	29	12	10	16.62	4.369	0	51	40.6	31.85	0.102 1031	1027.3	3.99	6.95	5	42.7	
	30	12	12	1.91	4.405	1	4	27.2	32.03	0.104 5581	1018.5	3.97	6.92	5	40.5	
July	1	12	13	48.07	+4.441	-1	17	18.2	-32.21	0.106 9921	+1009.8	3.95	6.88	5	38.4	
	2	12	15	35.09	+4.477	-1	30	13.5	-32.39	0.109 4053	+1001.2	3.93	6.84	5	36.2	

GREENWICH MEAN TIME.

Date,	Apparent Right Ascension,			Var. per Hour.	Apparent Declination,			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter,	Hor. Parallax.	Transit, Meridian of Greenwich.		
	Noon.				Noon.										
		h	m	s	s	°	'	"	"				h	m	
July	1	12	13	48.07	+4.441	-	1	17	18.2	-32.21	0.106 9921	+1009.8	3.95	6.88	5 38.4
	2	12	15	35.09	4.477		1	30	13.5	32.39	0.109 4053	1001.2	3.93	6.84	5 36.2
	3	12	17	22.98	4.513		1	43	13.1	32.57	0.111 7977	992.5	3.90	6.80	5 34.1
	4	12	19	11.71	4.548		1	56	16.8	32.74	0.114 1694	983.9	3.89	6.77	5 32.0
	5	12	21	1.29	4.584		2	9	24.5	32.90	0.116 5204	975.3	3.86	6.73	5 29.9
	6	12	22	51.72	+4.618	-	2	22	36.1	-33.06	0.118 8509	+ 966.7	3.84	6.69	5 27.8
	7	12	24	42.97	4.653		2	35	51.4	33.21	0.121 1607	958.1	3.82	6.66	5 25.7
	8	12	26	35.06	4.687		2	49	10.3	33.36	0.123 4500	949.6	3.80	6.62	5 23.6
	9	12	28	27.96	4.721		3	2	32.8	33.51	0.125 7187	941.0	3.78	6.59	5 21.6
	10	12	30	21.67	4.755		3	15	58.7	33.65	0.127 9669	932.5	3.76	6.55	5 19.5
	11	12	32	16.18	+4.788	-	3	29	27.8	-33.78	0.130 1946	+ 924.0	3.74	6.52	5 17.5
	12	12	34	11.48	4.820		3	43	0.0	33.90	0.132 4020	915.5	3.73	6.49	5 15.5
	13	12	36	7.56	4.853		3	56	35.2	34.03	0.134 5892	907.1	3.70	6.45	5 13.5
	14	12	38	4.42	4.885		4	10	13.2	34.14	0.136 7563	898.8	3.69	6.42	5 11.5
	15	12	40	2.05	4.917		4	23	53.8	34.24	0.138 9035	890.5	3.67	6.39	5 9.5
	16	12	42	0.43	+4.948	-	4	37	36.9	-34.35	0.141 0308	+ 882.2	3.65	6.36	5 7.5
	17	12	43	59.57	4.980		4	51	22.4	34.45	0.143 1384	874.1	3.63	6.33	5 5.6
	18	12	45	59.46	5.011		5	5	10.2	34.53	0.145 2265	866.0	3.62	6.30	5 3.6
	19	12	48	0.09	5.041		5	19	0.0	34.62	0.147 2953	858.0	3.60	6.27	5 1.7
	20	12	50	1.45	5.072		5	32	51.8	34.70	0.149 3451	850.1	3.58	6.24	4 59.8
	21	12	52	3.54	+5.102	-	5	46	45.4	-34.77	0.151 3761	+ 842.4	3.56	6.21	4 57.9
	22	12	54	6.35	5.132		6	0	40.7	34.84	0.153 3885	834.7	3.55	6.18	4 56.0
	23	12	56	9.89	5.162		6	14	37.6	34.90	0.155 3826	827.1	3.53	6.15	4 54.1
	24	12	58	14.15	5.192		6	28	35.9	34.96	0.157 3587	819.6	3.51	6.12	4 52.3
	25	13	0	19.12	5.222		6	42	35.6	35.01	0.159 3169	812.2	3.50	6.10	4 50.4
	26	13	2	24.81	+5.252	-	6	56	36.5	-35.06	0.161 2576	+ 805.0	3.48	6.07	4 48.6
	27	13	4	31.22	5.282		7	10	38.5	35.10	0.163 1810	797.9	3.47	6.04	4 46.7
	28	13	6	38.34	5.312		7	24	41.4	35.14	0.165 0874	790.8	3.46	6.02	4 44.9
	29	13	8	46.19	5.342		7	38	45.1	35.17	0.166 9768	783.8	3.44	5.99	4 43.1
	30	13	10	54.76	5.372		7	52	49.6	35.20	0.168 8496	776.9	3.42	5.96	4 41.3
	31	13	13	4.06	+5.402	-	8	6	54.7	-35.22	0.170 7057	+769.9	3.41	5.94	4 39.5
Aug.	1	13	15	14.08	5.433		8	21	0.3	35.24	0.172 5453	763.1	3.39	5.91	4 37.8
	2	13	17	24.83	5.463		8	35	6.3	35.25	0.174 3685	756.2	3.38	5.89	4 36.0
	3	13	19	36.31	5.494		8	49	12.5	35.26	0.176 1753	749.4	3.37	5.87	4 34.3
	4	13	21	48.53	5.524		9	3	18.8	35.26	0.177 9658	742.7	3.35	5.84	4 32.5
	5	13	24	1.48	+5.555	-	9	17	24.9	-35.25	0.179 7401	+ 735.9	3.34	5.82	4 30.8
	6	13	26	15.16	5.585		9	31	30.9	35.24	0.181 4982	729.2	3.32	5.79	4 29.1
	7	13	28	29.58	5.616		9	45	36.5	35.22	0.183 2402	722.5	3.31	5.77	4 27.4
	8	13	30	44.73	5.647		9	59	41.7	35.20	0.184 9662	715.9	3.30	5.75	4 25.7
	9	13	33	0.62	5.677		10	13	46.2	35.17	0.186 6763	709.2	3.29	5.73	4 24.0
	10	13	35	17.23	+5.707	-	10	27	49.9	-35.14	0.188 3705	+ 702.6	3.27	5.70	4 22.4
	11	13	37	34.57	5.737		10	41	52.6	35.09	0.190 0490	696.1	3.26	5.68	4 20.7
	12	13	39	52.63	5.768		10	55	54.1	35.04	0.191 7119	689.7	3.25	5.66	4 19.1
	13	13	42	11.43	5.798		11	9	54.3	34.98	0.193 3594	683.2	3.24	5.64	4 17.5
	14	13	44	30.95	5.829		11	23	53.0	34.91	0.194 9915	676.9	3.23	5.62	4 15.8
	15	13	46	51.20	+5.859	-	11	37	50.0	-34.84	0.196 6085	+ 670.6	3.21	5.60	4 14.2
	16	13	49	12.18	+5.889	-	11	51	45.3	-34.76	0.198 2105	+ 664.4	3.20	5.57	4 12.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	"							h	m
Aug. 16	13	49	12.18	+5.889	-11	51	45.3	-34.76	0.198 2105	+664.4	3.20	5.57	4 12.7
17	13	51	33.87	5.919	12	5	38.6	34.67	0.199 7978	658.3	3.19	5.55	4 11.1
18	13	53	56.29	5.949	12	19	29.7	34.59	0.201 3706	652.3	3.17	5.53	4 9.5
19	13	56	19.43	5.979	12	33	18.7	34.49	0.202 9290	646.4	3.16	5.51	4 8.0
20	13	58	43.29	6.009	12	47	5.3	34.39	0.204 4732	640.5	3.16	5.50	4 6.4
21	14	1	7.87	+6.040	-13	0	49.3	-34.28	0.206 0036	+634.8	3.15	5.48	4 4.9
22	14	3	33.19	6.070	13	14	30.5	34.15	0.207 5203	629.1	3.13	5.46	4 3.4
23	14	5	59.24	6.101	13	28	8.7	34.03	0.209 0236	623.6	3.12	5.44	4 1.9
24	14	8	26.02	6.131	13	41	43.9	33.90	0.210 5138	618.2	3.11	5.42	4 0.4
25	14	10	53.54	6.162	13	55	15.9	33.76	0.211 9910	612.8	3.10	5.40	3 58.9
26	14	13	21.81	+6.194	-14	8	44.5	-33.62	0.213 4553	+607.5	3.09	5.38	3 57.4
27	14	15	50.83	6.225	14	22	9.6	33.47	0.214 9071	602.3	3.08	5.36	3 56.0
28	14	18	20.60	6.256	14	35	31.1	33.31	0.216 3464	597.1	3.07	5.35	3 54.5
29	14	20	51.13	6.288	14	48	48.7	33.15	0.217 7733	592.0	3.06	5.33	3 53.1
30	14	23	22.42	6.320	15	2	2.3	32.98	0.219 1878	586.8	3.05	5.31	3 51.7
Sept. 1	14	25	54.48	+6.352	-15	15	11.7	-32.80	0.220 5901	+581.7	3.04	5.30	3 50.3
2	14	28	27.31	6.384	15	28	16.9	32.62	0.221 9801	576.6	3.03	5.28	3 48.9
3	14	31	0.92	6.416	15	41	17.5	32.43	0.223 3579	571.6	3.02	5.26	3 47.5
4	14	33	35.30	6.449	15	54	13.4	32.23	0.224 7237	566.6	3.01	5.24	3 46.1
5	14	36	10.46	6.481	16	7	4.5	32.02	0.226 0774	561.6	3.00	5.23	3 44.8
6	14	38	46.40	+6.514	-16	19	50.4	-31.80	0.227 4192	+556.6	2.99	5.21	3 43.4
7	14	41	23.11	6.546	16	32	31.1	31.59	0.228 7491	551.7	2.98	5.20	3 42.1
8	14	44	0.60	6.578	16	45	6.4	31.36	0.230 0672	546.8	2.97	5.18	3 40.8
9	14	46	38.87	6.611	16	57	36.1	31.12	0.231 3736	541.9	2.97	5.17	3 39.5
10	14	49	17.91	6.643	17	9	59.9	30.87	0.232 6683	537.1	2.96	5.15	3 38.2
11	14	51	57.73	+6.675	-17	22	17.8	-30.62	0.233 9515	+532.3	2.95	5.13	3 36.9
12	14	54	38.32	6.707	17	34	29.5	30.36	0.235 2232	527.5	2.94	5.12	3 35.7
13	14	57	19.69	6.740	17	46	34.8	30.09	0.236 4836	522.8	2.93	5.10	3 34.4
14	15	0	1.83	6.772	17	58	33.5	29.81	0.237 7327	518.2	2.92	5.09	3 33.2
15	15	2	44.73	6.804	18	10	25.4	29.52	0.238 9709	513.7	2.92	5.08	3 32.0
16	15	5	28.41	+6.836	-18	22	10.4	-29.23	0.240 1983	+509.2	2.91	5.06	3 30.8
17	15	8	12.86	6.868	18	33	48.3	28.93	0.241 4150	504.7	2.90	5.05	3 29.6
18	15	10	58.07	6.900	18	45	18.8	28.62	0.242 6212	500.4	2.89	5.03	3 28.4
19	15	13	44.04	6.931	18	56	41.8	28.30	0.243 8172	496.2	2.88	5.02	3 27.2
20	15	16	30.77	6.963	19	7	57.1	27.97	0.245 0031	492.1	2.87	5.00	3 26.0
21	15	19	18.26	+6.995	-19	19	4.5	-27.64	0.246 1792	+488.0	2.86	4.99	3 24.9
22	15	22	6.52	7.027	19	30	3.7	27.30	0.247 3457	484.1	2.86	4.98	3 23.7
23	15	24	55.54	7.059	19	40	54.7	26.95	0.248 5028	480.2	2.85	4.96	3 22.6
24	15	27	45.33	7.090	19	51	37.2	26.59	0.249 6505	476.3	2.84	4.95	3 21.5
25	15	30	35.88	7.122	20	2	11.1	26.23	0.250 7891	472.6	2.84	4.94	3 20.4
26	15	33	27.20	+7.154	-20	12	36.2	-25.86	0.251 9188	+468.8	2.83	4.93	3 19.3
27	15	36	19.29	7.186	20	22	52.3	25.48	0.253 0395	465.1	2.82	4.91	3 18.3
28	15	39	12.14	7.218	20	32	59.2	25.09	0.254 1513	461.4	2.81	4.90	3 17.2
29	15	42	5.77	7.250	20	42	56.7	24.70	0.255 2544	457.8	2.81	4.89	3 16.2
30	15	45	0.16	7.282	20	52	44.6	24.29	0.256 3487	454.2	2.80	4.88	3 15.1
Oct. 1	15	47	55.31	+7.314	-21	2	22.7	-23.88	0.257 4344	+450.6	2.79	4.86	3 14.1
2	15	50	51.22	+7.345	-21	11	50.9	-23.46	0.258 5114	+447.0	2.78	4.85	3 13.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.		
	h	m	s	s	°	'	"	"			"	"	h	m
Oct.	1	15	50 51.22	+7.345	-21	11	50.9	-23.46	0.258 5114	+447.0	2.78	4.85	3	13.1
	2	15	53 47.89	7.377	21	21	8.9	23.04	0.259 5798	443.4	2.78	4.84	3	12.1
	3	15	56 45.32	7.408	21	30	16.6	22.60	0.260 6397	439.9	2.77	4.83	3	11.1
	4	15	59 43.48	7.439	21	39	13.7	22.16	0.261 6911	436.3	2.77	4.82	3	10.1
	5	16	2 42.39	7.470	21	48	0.1	21.71	0.262 7340	432.8	2.76	4.80	3	9.2
	6	16	5 42.03	+7.500	-21	56	35.6	-21.25	0.263 7685	+429.3	2.75	4.79	3	8.2
	7	16	8 42.40	7.530	22	4	59.9	20.78	0.264 7947	425.9	2.74	4.78	3	7.3
	8	16	11 43.48	7.560	22	13	13.0	20.31	0.265 8127	422.5	2.74	4.77	3	6.4
	9	16	14 45.27	7.589	22	21	14.5	19.82	0.266 8225	419.1	2.73	4.76	3	5.5
	10	16	17 47.76	7.618	22	29	4.3	19.33	0.267 8242	415.7	2.73	4.75	3	4.6
	11	16	20 50.94	+7.647	-22	36	42.2	-18.83	0.268 8180	+412.4	2.72	4.74	3	3.7
	12	16	23 54.81	7.675	22	44	8.2	18.33	0.269 8038	409.2	2.72	4.73	3	2.8
	13	16	26 59.35	7.703	22	51	21.9	17.81	0.270 7820	406.0	2.71	4.72	3	1.9
	14	16	30 4.55	7.730	22	58	23.2	17.29	0.271 7525	402.8	2.70	4.71	3	1.1
	15	16	33 10.40	7.757	23	5	11.9	16.77	0.272 7156	399.7	2.70	4.70	3	0.3
	16	16	36 16.89	+7.784	-23	11	47.9	-16.23	0.273 6714	+396.7	2.69	4.69	2	59.4
	17	16	39 24.01	7.809	23	18	10.9	15.69	0.274 6201	393.9	2.69	4.68	2	58.6
	18	16	42 31.74	7.835	23	24	20.9	15.14	0.275 5620	391.0	2.68	4.67	2	57.8
	19	16	45 40.09	7.860	23	30	17.6	14.58	0.276 4971	388.3	2.67	4.66	2	57.0
	20	16	48 49.03	7.885	23	36	0.9	14.02	0.277 4258	385.6	2.67	4.65	2	56.2
	21	16	51 58.56	+7.909	-23	41	30.7	-13.46	0.278 3480	+382.9	2.66	4.64	2	55.4
	22	16	55 8.68	7.934	23	46	46.7	12.88	0.279 2640	380.4	2.66	4.63	2	54.6
	23	16	58 19.37	7.957	23	51	48.8	12.30	0.280 1739	377.9	2.65	4.62	2	53.9
	24	17	1 30.62	7.980	23	56	36.9	11.71	0.281 0777	375.3	2.65	4.61	2	53.1
	25	17	4 42.43	8.003	24	1	10.9	11.12	0.281 9755	372.9	2.64	4.60	2	52.4
	26	17	7 54.78	+8.026	-24	5	30.6	-10.52	0.282 8675	+370.5	2.63	4.59	2	51.6
	27	17	11 7.67	8.048	24	9	35.8	9.91	0.283 7537	368.0	2.63	4.58	2	50.9
	28	17	14 21.07	8.069	24	13	26.4	9.30	0.284 6340	365.6	2.62	4.57	2	50.2
	29	17	17 34.98	8.090	24	17	2.3	8.69	0.285 5085	363.2	2.62	4.56	2	49.5
	30	17	20 49.38	8.110	24	20	23.3	8.06	0.286 3772	360.8	2.61	4.55	2	48.8
Nov.	31	17	24 4.27	+8.130	-24	23	29.3	-7.44	0.287 2402	+358.4	2.61	4.54	2	48.1
	1	17	27 19.61	8.149	24	26	20.2	6.80	0.288 0974	356.0	2.60	4.53	2	47.4
	2	17	30 35.40	8.167	24	28	55.9	6.17	0.288 9489	353.6	2.59	4.52	2	46.7
	3	17	33 51.62	8.185	24	31	16.3	5.53	0.289 7947	351.2	2.59	4.52	2	46.0
	4	17	37 8.26	8.202	24	33	21.2	4.88	0.290 6349	348.9	2.59	4.51	2	45.4
	5	17	40 25.29	+8.218	-24	35	10.6	-4.23	0.291 4696	+346.6	2.58	4.50	2	44.7
	6	17	43 42.70	8.233	24	36	44.3	3.58	0.292 2988	344.4	2.58	4.49	2	44.1
	7	17	47 0.47	8.248	24	38	2.3	2.92	0.293 1225	342.1	2.57	4.48	2	43.4
	8	17	50 18.58	8.262	24	39	4.5	2.26	0.293 9409	339.9	2.57	4.47	2	42.8
	9	17	53 37.02	8.275	24	39	50.7	1.59	0.294 7539	337.7	2.56	4.46	2	42.1
	10	17	56 55.75	+8.286	-24	40	21.0	-0.93	0.295 5617	+335.5	2.56	4.46	2	41.5
	11	18	0 14.77	8.298	24	40	35.3	-0.26	0.296 3644	333.4	2.55	4.45	2	40.9
	12	18	3 34.05	8.309	24	40	33.5	+0.41	0.297 1621	331.4	2.55	4.44	2	40.3
	13	18	6 53.57	8.318	24	40	15.5	1.09	0.297 9549	329.3	2.54	4.43	2	39.7
	14	18	10 13.31	8.327	24	39	41.3	1.76	0.298 7429	327.4	2.54	4.42	2	39.0
	15	18	13 33.26	+8.335	-24	38	50.9	+2.44	0.299 5264	+325.5	2.53	4.41	2	38.4
16	18	16 53.41	+8.343	-24	37	44.2	+3.12	0.300 3054	+323.7	2.53	4.41	2	37.8	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	" ' "	"			"	"	h m
v. 16	18 16 53.41	+8.343	-24 37 44.2	+ 3.12	0.300 3054	+323.7	2.53	4.41	2 37.8
17	18 20 13.72	8.350	24 36 21.1	3.80	0.301 0801	321.9	2.53	4.40	2 37.2
18	18 23 34.19	8.356	24 34 41.7	4.48	0.301 8507	320.2	2.52	4.39	2 36.6
19	18 26 54.80	8.361	24 32 45.9	5.17	0.302 6173	318.6	2.51	4.38	2 36.0
20	18 30 15.53	8.366	24 30 33.6	5.85	0.303 3801	317.0	2.51	4.38	2 35.4
21	18 33 36.37	+8.370	-24 28 4.9	+ 6.54	0.304 1390	+315.4	2.51	4.37	2 34.8
22	18 36 57.30	8.374	24 25 19.7	7.23	0.304 8942	313.9	2.50	4.36	2 34.3
23	18 40 18.31	8.377	24 22 18.0	7.91	0.305 6458	312.4	2.50	4.35	2 33.7
24	18 43 39.39	8.379	24 18 59.9	8.60	0.306 3937	310.9	2.50	4.35	2 33.1
25	18 47 0.51	8.380	24 15 25.3	9.28	0.307 1380	309.4	2.49	4.34	2 32.5
26	18 50 21.65	+8.381	-24 11 34.3	+ 9.97	0.307 8787	+307.9	2.49	4.33	2 31.9
27	18 53 42.81	8.382	24 7 26.8	10.65	0.308 6157	306.3	2.48	4.32	2 31.3
28	18 57 3.96	8.381	24 3 3.0	11.34	0.309 3491	304.8	2.48	4.32	2 30.7
29	19 0 25.09	8.380	23 58 22.7	12.02	0.310 0790	303.3	2.47	4.31	2 30.1
30	19 3 46.18	8.378	23 53 26.1	12.70	0.310 8052	301.9	2.47	4.30	2 29.5
c. 1	19 7 7.22	+8.375	-23 48 13.2	+13.38	0.311 5279	+300.4	2.46	4.29	2 28.9
2	19 10 28.18	8.372	23 42 44.0	14.05	0.312 2470	298.9	2.46	4.29	2 28.3
3	19 13 49.06	8.368	23 36 58.7	14.72	0.312 9625	297.3	2.46	4.28	2 27.7
4	19 17 9.82	8.363	23 30 57.2	15.40	0.313 6745	295.9	2.45	4.27	2 27.1
5	19 20 30.46	8.357	23 24 39.6	16.06	0.314 3823	294.4	2.45	4.27	2 26.5
6	19 23 50.95	+8.351	-23 18 6.1	+16.73	0.315 0878	+293.0	2.45	4.26	2 25.9
7	19 27 11.29	8.344	23 11 16.7	17.39	0.315 7892	291.6	2.44	4.25	2 25.3
8	19 30 31.44	8.336	23 4 11.5	18.04	0.316 4873	290.2	2.44	4.25	2 24.7
9	19 33 51.40	8.327	22 56 50.6	18.69	0.317 1820	288.8	2.43	4.24	2 24.1
10	19 37 11.14	8.318	22 49 14.2	19.34	0.317 8735	287.5	2.43	4.23	2 23.5
11	19 40 30.66	+8.308	-22 41 22.2	+19.99	0.318 5618	+286.2	2.43	4.23	2 22.9
12	19 43 49.93	8.298	22 33 14.8	20.63	0.319 2471	284.9	2.42	4.22	2 22.3
13	19 47 8.95	8.287	22 24 52.1	21.26	0.319 9294	283.7	2.42	4.21	2 21.6
14	19 50 27.70	8.275	22 16 14.2	21.89	0.320 6088	282.5	2.42	4.21	2 21.0
15	19 53 46.16	8.263	22 7 21.3	22.52	0.321 2856	281.4	2.41	4.20	2 20.4
16	19 57 4.33	+8.251	-21 58 13.4	+23.14	0.321 9597	+280.4	2.41	4.19	2 19.8
17	20 0 22.20	8.238	21 48 50.8	23.75	0.322 6314	279.4	2.41	4.19	2 19.1
18	20 3 39.76	8.225	21 39 13.5	24.36	0.323 3007	278.4	2.40	4.18	2 18.5
19	20 6 56.99	8.211	21 29 21.6	24.96	0.323 9676	277.4	2.39	4.17	2 17.8
20	20 10 13.89	8.197	21 19 15.3	25.56	0.324 6323	276.5	2.39	4.17	2 17.1
21	20 13 30.46	+8.183	-21 8 54.7	+26.15	0.325 2948	+275.6	2.39	4.16	2 16.5
22	20 16 46.68	8.169	20 58 20.0	26.74	0.325 9551	274.7	2.38	4.15	2 15.8
23	20 20 2.55	8.154	20 47 31.2	27.32	0.326 6132	273.8	2.38	4.15	2 15.1
24	20 23 18.06	8.139	20 36 28.5	27.90	0.327 2691	272.8	2.38	4.14	2 14.4
25	20 26 33.20	8.123	20 25 12.1	28.46	0.327 9228	271.9	2.38	4.14	2 13.7
26	20 29 47.97	+8.107	-20 13 42.2	+29.03	0.328 5743	+271.0	2.37	4.13	2 13.0
27	20 33 2.36	8.091	20 1 58.8	29.58	0.329 2235	270.0	2.36	4.12	2 12.3
28	20 36 16.36	8.075	19 50 2.3	30.13	0.329 8705	269.1	2.36	4.12	2 11.6
29	20 39 29.97	8.059	19 37 52.8	30.67	0.330 5152	268.1	2.36	4.11	2 10.9
30	20 42 43.17	8.042	19 25 30.4	31.20	0.331 1576	267.2	2.35	4.10	2 10.2
31	20 45 55.97	+8.025	-19 12 55.4	+31.72	0.331 7977	+266.2	2.35	4.10	2 9.5
32	20 49 8.35	....	-19 0 7.8	....	0.332 4354	....	2.35	4.09	2 8.7

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	" "	"	" ' "	"		
Jan.	0	141 33 46.3	26 20.5	- 4.9	+1 50 53.5	- 2.4	0.220 5110	+ 767
	2	142 26 26.1	26 19.4	6.6	1 50 48.1	3.1	0.220 6592	715
	4	143 19 3.8	26 18.4	8.2	1 50 41.1	3.9	0.220 7971	664
	6	144 11 39.7	26 17.5	9.8	1 50 32.5	4.7	0.220 9248	612
	8	145 4 13.7	26 16.6	11.4	1 50 22.3	5.5	0.221 0421	561
	10	145 56 46.1	26 15.8	-13.0	+1 50 10.6	- 6.2	0.221 1491	+ 509
	12	146 49 17.0	26 15.1	14.6	1 49 57.4	7.0	0.221 2458	458
	14	147 41 46.6	26 14.5	16.2	1 49 42.7	7.7	0.221 3322	406
	16	148 34 15.0	26 13.9	17.8	1 49 26.6	8.5	0.221 4082	354
	18	149 26 42.3	26 13.4	19.3	1 49 8.8	9.3	0.221 4739	302
	20	150 19 8.7	26 13.0	-20.8	+1 48 49.5	-10.0	0.221 5291	+ 250
	22	151 11 34.4	26 12.7	22.3	1 48 28.6	10.8	0.221 5740	198
	24	152 3 59.5	26 12.4	23.8	1 48 6.3	11.5	0.221 6085	146
	26	152 56 24.1	26 12.2	25.3	1 47 42.5	12.2	0.221 6326	94
	28	153 48 48.5	26 12.1	26.7	1 47 17.3	13.0	0.221 6462	+ 42
	30	154 41 12.7	26 12.1	-28.1	+1 46 50.4	-13.8	0.221 6495	- 10
Feb.	1	155 33 36.9	26 12.1	29.5	1 46 22.1	14.5	0.221 6424	62
	3	156 26 1.2	26 12.2	30.9	1 45 52.3	15.2	0.221 6249	113
	5	157 18 25.9	26 12.4	32.2	1 45 21.1	16.0	0.221 5971	166
	7	158 10 51.0	26 12.7	33.5	1 44 48.4	16.7	0.221 5589	217
	9	159 3 16.6	26 13.0	-34.8	+1 44 14.2	-17.4	0.221 5104	- 269
	11	159 55 43.1	26 13.4	36.0	1 43 38.6	18.2	0.221 4514	321
	13	160 48 10.4	26 13.9	37.2	1 43 1.4	19.0	0.221 3820	373
	15	161 40 38.8	26 14.5	38.4	1 42 22.8	19.7	0.221 3023	424
	17	162 33 8.4	26 15.1	39.5	1 41 42.8	20.4	0.221 2123	476
	19	163 25 39.3	26 15.8	-40.6	+1 41 1.4	-21.1	0.221 1119	- 528
	21	164 18 11.7	26 16.6	41.6	1 40 18.5	21.8	0.221 0013	579
	23	165 10 45.8	26 17.5	42.7	1 39 34.1	22.5	0.220 8802	631
	25	166 3 21.7	26 18.4	43.6	1 38 48.4	23.2	0.220 7489	683
	27	166 55 59.5	26 19.5	44.6	1 38 1.2	23.9	0.220 6072	734
Mar.	1	167 48 39.4	26 20.5	-45.5	+1 37 12.6	-24.6	0.220 4553	- 785
	3	168 41 21.6	26 21.7	46.4	1 36 22.6	25.3	0.220 2931	836
	5	169 34 6.1	26 22.9	47.2	1 35 31.2	26.0	0.220 1207	888
	7	170 26 53.2	26 24.2	47.9	1 34 38.5	26.7	0.219 9381	939
	9	171 19 42.9	26 25.6	48.7	1 33 44.3	27.4	0.219 7453	989
	11	172 12 35.6	26 27.1	-49.4	+1 32 48.8	-28.1	0.219 5424	-1040
	13	173 5 31.2	26 28.6	50.0	1 31 51.9	28.8	0.219 3292	1091
	15	173 58 29.9	26 30.2	50.6	1 30 53.7	29.5	0.219 1059	1142
	17	174 51 32.0	26 31.9	51.1	1 29 54.0	30.2	0.218 8726	1192
	19	175 44 37.5	26 33.6	51.6	1 28 53.0	30.8	0.218 6292	1242
	21	176 37 46.6	26 35.5	-52.0	+1 27 50.7	-31.5	0.218 3757	-1292
	23	177 30 59.4	26 37.4	52.4	1 26 47.0	32.2	0.218 1123	1342
	25	178 24 16.2	26 39.4	52.8	1 25 42.0	32.8	0.217 8389	1392
	27	179 17 37.0	26 41.4	53.1	1 24 35.7	33.5	0.217 5555	1441
	29	180 11 1.9	26 43.6	53.3	1 23 28.1	34.1	0.217 2624	1490
	31	181 4 31.3	26 45.8	-53.5	+1 22 19.2	-34.8	0.216 9593	-1540
Apr.	2	181 58 5.2	26 48.1	-53.7	+1 21 8.9	-35.5	0.216 6464	-1589

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" " "	" "	"	" " "	"		
pr.	2	181 58 5.2	26 48.1	-53.7	+1 21 8.9	-35.5	0.216 6464	-1589
	4	182 51 43.7	26 50.4	53.8	1 19 57.4	36.0	0.216 3237	1638
	6	183 45 27.0	26 52.9	53.8	1 18 44.7	36.7	0.215 9913	1686
	8	184 39 15.3	26 55.4	53.8	1 17 30.6	37.3	0.215 6492	1735
	10	185 33 8.6	26 58.0	53.7	1 16 15.4	38.0	0.215 2974	1783
	12	186 27 7.3	27 0.7	-53.6	+1 14 58.8	-38.6	0.214 9361	-1830
	14	187 21 11.3	27 3.4	53.4	1 13 41.0	39.2	0.214 5652	1878
	16	188 15 21.0	27 6.2	53.2	1 12 22.0	39.8	0.214 1848	1925
	18	189 9 36.3	27 9.1	52.9	1 11 1.8	40.4	0.213 7950	1972
	20	190 3 57.5	27 12.1	52.6	1 9 40.3	41.0	0.213 3958	2019
	22	190 58 24.7	27 15.1	-52.2	+1 8 17.6	-41.6	0.212 9873	-2066
	24	191 52 58.1	27 18.3	51.7	1 6 53.8	42.3	0.212 5695	2112
	26	192 47 37.8	27 21.5	51.2	1 5 28.7	42.8	0.212 1426	2158
	28	193 42 24.0	27 24.7	50.7	1 4 2.5	43.4	0.211 7065	2206
	30	194 37 16.8	27 28.1	50.1	1 2 35.2	44.0	0.211 2613	2248
ay	2	195 32 16.4	27 31.5	-49.4	+1 1 6.7	-44.5	0.210 8071	-2293
	4	196 27 22.8	27 35.0	48.7	0 59 37.1	45.1	0.210 3439	2338
	6	197 22 36.4	27 38.6	48.0	0 58 6.3	45.6	0.209 8719	2382
	8	198 17 57.2	27 42.2	47.2	0 56 34.5	46.2	0.209 3912	2426
	10	199 13 25.4	27 46.0	46.3	0 55 1.6	46.8	0.208 9017	2469
	12	200 9 1.1	27 49.8	-45.4	+0 53 27.6	-47.3	0.208 4036	-2512
	14	201 4 44.6	27 53.7	44.4	0 51 52.5	47.8	0.207 8970	2554
	16	202 0 35.8	27 57.6	43.4	0 50 16.4	48.3	0.207 3819	2596
	18	202 56 35.1	28 1.6	42.4	0 48 39.3	48.8	0.206 8585	2638
	20	203 52 42.4	28 5.7	41.3	0 47 1.2	49.3	0.206 3268	2679
	22	204 48 58.1	28 9.9	-40.1	+0 45 22.1	-49.8	0.205 7869	-2720
	24	205 45 22.1	28 14.2	38.9	0 43 42.0	50.3	0.205 2389	2760
	26	206 41 54.8	28 18.5	37.7	0 42 0.9	50.8	0.204 6830	2799
	28	207 38 36.1	28 22.8	36.4	0 40 18.9	51.3	0.204 1192	2838
	30	208 35 26.2	28 27.3	35.1	0 38 36.0	51.7	0.203 5476	2877
une	1	209 32 25.4	28 31.9	-33.7	+0 36 52.1	-52.3	0.202 9684	-2915
	3	210 29 33.8	28 36.5	32.3	0 35 7.4	52.6	0.202 3815	2953
	5	211 26 51.4	28 41.2	30.8	0 33 21.8	53.0	0.201 7873	2990
	7	212 24 18.5	28 45.9	29.3	0 31 35.3	53.4	0.201 1858	3026
	9	213 21 55.1	28 50.8	27.8	0 29 48.0	53.8	0.200 5770	3061
	11	214 19 41.6	28 55.7	-26.2	+0 27 59.9	-54.3	0.199 9612	-3096
	13	215 17 37.8	29 0.7	24.6	0 26 11.0	54.6	0.199 3385	3131
	15	216 15 44.2	29 5.7	23.0	0 24 21.3	55.0	0.198 7089	3166
	17	217 14 0.6	29 10.8	21.4	0 22 30.9	55.4	0.198 0728	3198
	19	218 12 27.4	29 16.0	19.7	0 20 39.8	55.7	0.197 4298	3230
	21	219 11 4.5	29 21.2	-18.0	+0 18 48.0	-56.1	0.196 7806	-3262
	23	220 9 52.2	29 26.5	16.2	0 16 55.6	56.4	0.196 1252	3293
	25	221 8 50.6	29 31.9	14.4	0 15 2.5	56.7	0.195 4637	3322
	27	222 7 59.9	29 37.4	12.6	0 13 8.8	57.0	0.194 7962	3352
	29	223 7 20.1	29 42.9	10.8	0 11 14.5	57.3	0.194 1229	3381
ly	1	224 6 51.4	29 48.4	-9.0	+0 9 19.6	-57.5	0.193 4440	-3408
	3	225 6 33.9	29 54.1	-7.2	+0 7 24.3	-57.8	0.192 7596	-3435

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.
		° ' "	' "	"	° ' "	"	
July	1	224 6 51.4	29 48.4	- 9.0	+0 9 19.6	-57.5	0.193 4440
	3	225 6 33.9	29 54.1	7.2	0 7 24.3	57.3	0.192 7596
	5	226 6 27.8	29 59.8	5.3	0 5 28.4	58.1	0.192 0700
	7	227 6 33.1	30 5.5	3.4	0 3 32.0	58.3	0.191 3752
	9	228 6 50.0	30 11.4	- 1.5	+0 1 35.2	58.5	0.190 6755
	11	229 7 18.7	30 17.3	+ 0.4	-0 0 22.0	-58.7	0.189 9711
	13	230 7 59.1	30 23.2	2.3	0 2 19.5	58.9	0.189 2620
	15	231 8 51.5	30 29.2	4.2	0 4 17.5	59.1	0.188 5487
	17	232 9 56.0	30 35.3	6.1	0 6 15.8	59.2	0.187 8311
	19	233 11 12.6	30 41.4	8.0	0 8 14.3	59.3	0.187 1095
	21	234 12 41.5	30 47.5	+ 9.9	-0 10 13.1	-59.4	0.186 3841
	23	235 14 22.8	30 53.8	11.8	0 12 12.0	59.5	0.185 6552
	25	236 16 16.6	31 0.0	13.6	0 14 11.1	59.6	0.184 9229
	27	237 18 23.0	31 6.3	15.5	0 16 10.3	59.6	0.184 1875
	29	238 20 42.0	31 12.7	17.4	0 18 9.7	59.6	0.183 4491
	31	239 23 13.9	31 19.2	+19.2	-0 20 9.0	-59.6	0.182 7080
Aug.	2	240 25 58.6	31 25.6	21.0	0 22 8.4	59.7	0.181 9645
	4	241 28 56.3	31 32.1	22.8	0 24 7.8	59.7	0.181 2187
	6	242 32 7.0	31 38.6	24.6	0 26 7.0	59.6	0.180 4709
	8	243 35 30.9	31 45.2	26.3	0 28 6.2	59.5	0.179 7215
	10	244 39 7.9	31 51.8	+28.0	-0 30 5.1	-59.4	0.178 9704
	12	245 42 58.3	31 58.5	29.8	0 32 3.9	59.3	0.178 2182
	14	246 47 2.0	32 5.2	31.4	0 34 2.4	59.2	0.177 4649
	16	247 51 19.1	32 11.9	33.0	0 36 0.6	59.0	0.176 7100
	18	248 55 49.6	32 18.6	34.6	0 37 58.4	58.8	0.175 9564
	20	250 0 33.6	32 25.4	+36.1	-0 39 55.9	-58.6	0.175 2018
	22	251 5 31.2	32 32.2	37.6	0 41 52.9	58.4	0.174 4471
	24	252 10 42.5	32 39.0	39.0	0 43 49.5	58.2	0.173 6929
	26	253 16 7.4	32 45.9	40.4	0 45 45.5	57.9	0.172 9393
	28	254 21 46.0	32 52.7	41.7	0 47 40.9	57.5	0.172 1866
	30	255 27 38.3	32 59.6	+43.0	-0 49 35.6	-57.2	0.171 4351
Sept.	1	256 33 44.5	33 6.5	44.2	0 51 29.6	56.8	0.170 6851
	3	257 40 4.3	33 13.3	45.4	0 53 22.9	56.4	0.169 9370
	5	258 46 37.9	33 20.3	46.4	0 55 15.4	56.0	0.169 1909
	7	259 53 25.4	33 27.2	47.5	0 57 7.1	55.6	0.168 4473
	9	261 0 26.6	33 34.0	+48.4	-0 58 57.7	-55.1	0.167 7064
	11	262 7 41.6	33 40.9	49.3	1 0 47.5	54.6	0.166 9685
	13	263 15 10.4	33 47.8	50.1	1 2 36.1	54.0	0.166 2340
	15	264 22 53.0	33 54.7	50.8	1 4 23.7	53.5	0.165 5031
	17	265 30 49.3	34 1.6	51.5	1 6 10.2	52.9	0.164 7763
	19	266 38 59.3	34 8.4	+52.1	-1 7 55.4	-52.3	0.164 0537
	21	267 47 23.0	34 15.3	52.6	1 9 39.4	51.7	0.163 3358
	23	268 56 0.3	34 22.0	53.0	1 11 22.1	51.0	0.162 6229
	25	270 4 51.1	34 28.8	53.3	1 13 3.4	50.3	0.161 9153
	27	271 13 55.6	34 35.6	53.6	1 14 43.2	49.6	0.161 2132
	29	272 23 13.4	34 42.2	+53.7	-1 16 21.6	-48.8	0.160 5173
Oct.	1	273 32 44.6	34 48.9	+53.8	-1 17 58.4	-48.0	0.159 8277

FOR GREENWICH MEAN NOON.

Date.	Helio-centric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Helio-centric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	" ' "	" "	"	" ' "	"		
ct. 1	273 32 44.6	34 48.9	+53.8	-1 17 58.4	-48.0	0.159 8277	-3432
3	274 42 29.2	34 55.6	53.8	1 19 33.6	47.2	0.159 1447	3398
5	275 52 26.9	35 2.1	53.7	1 21 7.1	46.4	0.158 4686	3362
7	277 2 37.6	35 8.6	53.5	1 22 39.0	45.5	0.157 7999	3324
9	278 13 1.5	35 15.2	53.2	1 24 9.0	44.5	0.157 1389	3285
11	279 23 38.2	35 21.5	+52.8	-1 25 37.1	-43.6	0.156 4859	-3244
13	280 34 27.6	35 27.9	52.4	1 27 3.4	42.6	0.155 8413	3202
15	281 45 29.7	35 34.2	51.8	1 28 27.7	41.6	0.155 2053	3157
17	282 56 44.4	35 40.4	51.1	1 29 49.9	40.6	0.154 5784	3111
19	284 8 11.3	35 46.5	50.4	1 31 10.0	39.6	0.153 9608	3064
21	285 19 50.5	35 52.6	+49.6	-1 32 28.1	-38.5	0.153 3530	-3014
23	286 31 41.7	35 58.6	48.7	1 33 43.9	37.3	0.152 7552	2963
25	287 43 44.8	36 4.5	47.7	1 34 57.4	36.2	0.152 1678	2910
27	288 55 59.6	36 10.3	46.6	1 36 8.7	35.0	0.151 5911	2856
29	290 8 25.8	36 16.0	45.4	1 37 17.5	33.8	0.151 0255	2800
31	291 21 3.4	36 21.6	+44.1	-1 38 23.9	-32.6	0.150 4713	-2742
ov. 2	292 33 52.0	36 27.0	42.8	1 39 27.9	31.4	0.149 9288	2683
4	293 46 51.5	36 32.4	41.4	1 40 29.3	30.1	0.149 3983	2622
6	295 0 1.7	36 37.7	39.9	1 41 28.2	28.8	0.148 8802	2559
8	296 13 22.3	36 42.9	38.3	1 42 24.4	27.4	0.148 3746	2496
10	297 26 53.2	36 47.9	+36.7	-1 43 17.9	-26.1	0.147 8820	-2430
12	298 40 33.9	36 52.8	34.9	1 44 8.8	24.7	0.147 4027	2362
14	299 54 24.4	36 57.6	33.1	1 44 56.8	23.3	0.146 9370	2294
16	301 8 24.3	37 2.2	31.3	1 45 42.1	21.9	0.146 4851	2224
18	302 22 33.3	37 6.8	29.4	1 46 24.5	20.5	0.146 0473	2153
20	303 36 51.3	37 11.2	+27.4	-1 47 4.0	-19.0	0.145 6238	-2081
22	304 51 17.9	37 15.4	25.4	1 47 40.5	17.5	0.145 2151	2006
24	306 5 52.7	37 19.4	23.3	1 48 14.1	16.0	0.144 8213	1931
26	307 20 35.5	37 23.4	21.2	1 48 44.7	14.5	0.144 4426	1855
28	308 35 26.1	37 27.1	19.0	1 49 12.3	13.0	0.144 0794	1777
30	309 50 24.0	37 30.8	+16.8	-1 49 36.8	-11.5	0.143 7319	-1698
lec. 2	311 5 29.1	37 34.2	14.5	1 49 58.3	10.0	0.143 4003	1618
4	312 20 40.9	37 37.5	12.2	1 50 16.6	8.4	0.143 0848	1537
6	313 35 59.0	37 40.6	9.9	1 50 31.7	6.8	0.142 7856	1455
8	314 51 23.2	37 43.6	7.6	1 50 43.6	5.2	0.142 5029	1372
10	316 6 53.2	37 46.4	+ 5.3	-1 50 52.4	- 3.6	0.142 2369	-1288
12	317 22 28.6	37 48.9	2.9	1 50 58.0	2.0	0.141 9878	1203
14	318 38 8.9	37 51.4	+ 0.6	1 51 0.4	- 0.4	0.141 7558	1117
16	319 53 54.0	37 53.6	- 1.8	1 50 59.5	+ 1.2	0.141 5410	1031
18	321 9 43.4	37 55.7	4.2	1 50 55.5	2.8	0.141 3436	944
20	322 25 36.7	37 57.6	- 6.5	-1 50 48.1	+ 4.5	0.141 1636	- 856
22	323 41 33.6	37 59.3	8.9	1 50 37.6	6.1	0.141 0013	767
24	324 57 33.7	38 0.8	11.2	1 50 23.7	7.7	0.140 8567	678
26	326 13 36.7	38 2.1	13.6	1 50 6.7	9.3	0.140 7300	589
28	327 29 42.1	38 3.2	15.8	1 49 46.3	11.0	0.140 6212	499
30	328 45 49.5	38 4.2	-18.1	-1 49 22.8	+12.6	0.140 5305	- 408
32	330 1 58.6	38 4.9	-20.3	-1 48 56.0	+14.2	0.140 4578	- 318

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.		
	h	m	s	s	°	'	"	"			"	"	h	m
Jan.	1	4	2 28.89	-0.866	+19	54	18.3	-1.84	0.627 6000	+430.2	22.19	2.07	9	19.5
	2	4	2 8.47	0.835	19	53	35.2	1.76	0.628 6434	439.2	22.13	2.07	9	15.2
	3	4	1 48.79	0.805	19	52	54.0	1.67	0.629 7082	448.0	22.08	2.06	9	11.0
	4	4	1 29.85	0.773	19	52	15.0	1.58	0.630 7938	456.6	22.02	2.06	9	6.8
	5	4	1 11.67	0.741	19	51	38.1	1.49	0.631 8998	465.0	21.97	2.05	9	2.5
	6	4	0 54.27	-0.709	+19	51	3.3	-1.40	0.633 0255	+473.1	21.91	2.05	8	58.3
	7	4	0 37.64	0.676	19	50	30.8	1.31	0.634 1703	480.9	21.85	2.04	8	54.1
	8	4	0 21.80	0.643	19	50	0.4	1.22	0.635 3337	488.5	21.79	2.04	8	49.9
	9	4	0 6.76	0.610	19	49	32.3	1.12	0.636 5149	495.8	21.74	2.03	8	45.7
	10	3	59 52.53	0.576	19	49	6.5	1.03	0.637 7135	502.9	21.68	2.03	8	41.6
	11	3	59 39.11	-0.542	+19	48	43.0	-0.93	0.638 9287	+509.7	21.61	2.02	8	37.4
	12	3	59 26.52	0.507	19	48	21.8	0.83	0.640 1600	516.3	21.55	2.02	8	33.3
	13	3	59 14.76	0.472	19	48	3.0	0.73	0.641 4068	522.6	21.49	2.01	8	29.2
	14	3	59 3.84	0.437	19	47	46.7	0.63	0.642 6684	528.7	21.43	2.00	8	25.1
	15	3	58 53.77	0.402	19	47	32.7	0.53	0.643 9442	534.4	21.37	2.00	8	21.0
	16	3	58 44.54	-0.367	+19	47	21.2	-0.43	0.645 2334	+539.9	21.30	1.99	8	16.9
	17	3	58 36.16	0.331	19	47	12.1	0.33	0.646 5355	545.1	21.24	1.99	8	12.8
	18	3	58 28.63	0.296	19	47	5.5	0.22	0.647 8498	550.1	21.18	1.98	8	8.8
	19	3	58 21.95	0.260	19	47	1.4	0.12	0.649 1756	554.7	21.11	1.97	8	4.7
	20	3	58 16.14	0.224	19	46	59.7	-0.02	0.650 5123	559.2	21.05	1.97	8	0.7
	21	3	58 11.19	-0.188	+19	47	0.5	+0.09	0.651 8593	+563.3	20.98	1.96	7	56.7
	22	3	58 7.10	0.153	19	47	3.8	0.19	0.653 2159	567.2	20.92	1.96	7	52.7
	23	3	58 3.86	0.117	19	47	9.5	0.29	0.654 5818	570.9	20.85	1.95	7	48.7
	24	3	58 1.48	0.081	19	47	17.8	0.40	0.655 9562	574.4	20.78	1.94	7	44.8
	25	3	57 59.96	0.046	19	47	28.5	0.50	0.657 3387	577.7	20.72	1.94	7	40.8
	26	3	57 59.29	-0.010	+19	47	41.7	+0.60	0.658 7288	+580.7	20.65	1.93	7	36.9
	27	3	57 59.47	+0.025	19	47	57.3	0.70	0.660 1259	583.5	20.59	1.92	7	32.9
	28	3	58 0.51	0.061	19	48	15.4	0.81	0.661 5294	586.1	20.52	1.92	7	29.0
	29	3	58 2.40	0.096	19	48	36.0	0.91	0.662 9389	588.5	20.45	1.91	7	25.1
	30	3	58 5.14	0.132	19	48	58.9	1.01	0.664 3539	590.7	20.39	1.91	7	21.3
Feb.	31	3	58 8.72	+0.167	+19	49	24.3	+1.11	0.665 7739	+592.6	20.32	1.90	7	17.4
	1	3	58 13.14	0.502	19	49	52.1	1.21	0.667 1983	594.4	20.25	1.89	7	13.5
	2	3	58 18.41	0.237	19	50	22.3	1.31	0.668 6266	595.9	20.19	1.89	7	9.7
	3	3	58 24.51	0.272	19	50	54.9	1.41	0.670 0584	597.3	20.12	1.88	7	5.9
	4	3	58 31.45	0.306	19	51	29.8	1.50	0.671 4932	598.4	20.05	1.87	7	2.1
	5	3	58 39.22	+0.341	+19	52	7.1	+1.60	0.672 9306	+599.4	19.99	1.87	6	58.3
	6	3	58 47.82	0.376	19	52	46.7	1.70	0.674 3702	600.2	19.92	1.86	6	54.5
	7	3	58 57.25	0.410	19	53	28.6	1.79	0.675 8115	600.8	19.85	1.86	6	50.7
	8	3	59 7.50	0.444	19	54	12.8	1.89	0.677 2539	601.2	19.79	1.85	6	46.9
	9	3	59 18.58	0.479	19	54	59.2	1.98	0.678 6971	601.4	19.72	1.84	6	43.2
	10	3	59 30.47	+0.512	+19	55	47.9	+2.08	0.680 1405	+601.4	19.66	1.84	6	39.5
	11	3	59 43.17	0.546	19	56	38.8	2.16	0.681 5836	601.2	19.59	1.83	6	35.7
	12	3	59 56.67	0.579	19	57	31.8	2.25	0.683 0261	600.8	19.53	1.83	6	32.0
	13	4	0 10.98	0.613	19	58	27.0	2.34	0.684 4674	600.2	19.46	1.82	6	28.3
	14	4	0 26.08	0.646	19	59	24.3	2.43	0.685 9072	599.6	19.40	1.81	6	24.7
	15	4	0 41.97	+0.678	+20	0	23.6	+2.51	0.687 3450	+598.6	19.33	1.81	6	21.0
16	4	0 58.64	+0.711	+20	1	25.0	+2.60	0.688 7804	+597.5	19.27	1.80	6	17.4	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.		
	Hour.	Min.	Sec.		Hour.	Min.	Sec.							Hour.	Min.	Sec.
	h	m	s	s	°	'	"	"					h	m	
J.	16	4	0	58.64	+0.711	+20	1	25.0	+2.60	0.688 7804	+597.5	19.27	1.80	6	17.4
	17	4	1	16.08	0.743	20	2	28.4	2.68	0.690 2129	596.2	19.21	1.80	6	13.7
	18	4	1	34.29	0.774	20	3	33.7	2.76	0.691 6421	594.8	19.14	1.79	6	10.1
	19	4	1	53.25	0.806	20	4	41.0	2.84	0.693 0677	593.2	19.08	1.78	6	6.5
	20	4	2	12.97	0.837	20	5	50.1	2.92	0.694 4895	591.5	19.02	1.78	6	2.9
	21	4	2	33.42	+0.868	+20	7	1.1	+3.00	0.695 9070	+589.7	18.96	1.77	5	59.3
	22	4	2	54.62	0.898	20	8	13.9	3.07	0.697 3201	587.8	18.90	1.77	5	55.7
	23	4	3	16.54	0.928	20	9	28.5	3.14	0.698 7284	585.7	18.83	1.76	5	52.1
	24	4	3	39.18	0.958	20	10	44.8	3.21	0.700 1315	583.5	18.77	1.76	5	48.6
	25	4	4	2.54	0.988	20	12	2.7	3.28	0.701 5293	581.3	18.71	1.75	5	45.0
U.	26	4	4	26.60	+1.017	+20	13	22.4	+3.35	0.702 9214	+578.8	18.65	1.74	5	41.5
	27	4	4	51.36	1.046	20	14	43.6	3.42	0.704 3075	576.3	18.59	1.74	5	38.0
	28	4	5	16.81	1.075	20	16	6.4	3.48	0.705 6874	573.6	18.53	1.73	5	34.5
	1	4	5	42.94	1.103	20	17	30.7	3.54	0.707 0608	570.9	18.48	1.73	5	31.0
	2	4	6	9.75	1.131	20	18	56.5	3.61	0.708 4275	568.0	18.42	1.72	5	27.5
	3	4	6	37.23	+1.159	+20	20	23.8	+3.67	0.709 7872	+565.1	18.36	1.72	5	24.0
	4	4	7	5.37	1.186	20	21	52.5	3.72	0.711 1397	562.0	18.30	1.71	5	20.6
	5	4	7	34.17	1.214	20	23	22.5	3.78	0.712 4847	558.8	18.25	1.71	5	17.1
	6	4	8	3.62	1.241	20	24	53.9	3.83	0.713 8220	555.6	18.19	1.70	5	13.7
	7	4	8	33.72	1.267	20	26	26.5	3.89	0.715 1514	552.2	18.14	1.70	5	10.3
F.	8	4	9	4.45	+1.294	+20	28	0.4	+3.94	0.716 4726	+548.8	18.08	1.69	5	6.8
	9	4	9	35.81	1.320	20	29	35.4	3.98	0.717 7854	545.2	18.03	1.69	5	3.4
	10	4	10	7.80	1.346	20	31	11.6	4.03	0.719 0896	541.6	17.97	1.68	5	0.0
	11	4	10	40.40	1.371	20	32	48.9	4.08	0.720 3849	537.8	17.92	1.68	4	56.6
	12	4	11	13.61	1.396	20	34	27.3	4.12	0.721 6710	533.9	17.86	1.67	4	53.2
	13	4	11	47.42	+1.421	+20	36	6.7	+4.16	0.722 9478	+530.0	17.81	1.67	4	49.9
	14	4	12	21.82	1.446	20	37	47.1	4.20	0.724 2150	526.0	17.76	1.66	4	46.5
	15	4	12	56.81	1.470	20	39	28.4	4.24	0.725 4723	521.8	17.71	1.66	4	43.2
	16	4	13	32.37	1.494	20	41	10.6	4.28	0.726 7197	517.7	17.66	1.65	4	39.8
	17	4	14	8.50	1.517	20	42	53.6	4.31	0.727 9569	513.4	17.61	1.65	4	36.5
r.	18	4	14	45.20	+1.541	+20	44	37.4	+4.34	0.729 1837	+509.0	17.56	1.64	4	33.2
	19	4	15	22.45	1.563	20	46	22.0	4.37	0.730 3999	504.5	17.51	1.64	4	29.9
	20	4	16	0.24	1.586	20	48	7.3	4.40	0.731 6055	500.1	17.46	1.63	4	26.6
	21	4	16	38.56	1.608	20	49	53.2	4.43	0.732 8003	495.6	17.41	1.63	4	23.3
	22	4	17	17.41	1.629	20	51	39.8	4.45	0.733 9842	491.0	17.37	1.62	4	20.0
	23	4	17	56.77	+1.651	+20	53	27.0	+4.48	0.735 1572	+486.4	17.32	1.62	4	16.7
	24	4	18	36.64	1.672	20	55	14.6	4.50	0.736 3189	481.7	17.27	1.61	4	13.4
	25	4	19	17.01	1.692	20	57	2.8	4.52	0.737 4694	477.0	17.23	1.61	4	10.2
	26	4	19	57.88	1.713	20	58	51.5	4.54	0.738 6084	472.2	17.18	1.61	4	6.9
	27	4	20	39.24	1.733	21	0	40.5	4.55	0.739 7360	467.4	17.14	1.60	4	3.7
r.	28	4	21	21.08	+1.753	+21	2	30.0	+4.57	0.740 8519	+462.6	17.09	1.60	4	0.4
	29	4	22	3.38	1.772	21	4	19.7	4.58	0.741 9562	457.7	17.05	1.59	3	57.2
	30	4	22	46.16	1.792	21	6	9.8	4.59	0.743 0488	452.8	17.01	1.59	3	54.0
	31	4	23	29.39	1.811	21	8	0.1	4.60	0.744 1295	447.8	16.96	1.59	3	50.8
	1	4	24	13.08	1.830	21	9	50.6	4.61	0.745 1983	442.8	16.92	1.58	3	47.6
	2	4	24	57.22	+1.848	+21	11	41.3	+4.61	0.746 2550	+437.8	16.88	1.58	3	44.4
	3	4	25	41.80	+1.866	+21	13	32.1	+4.62	0.747 2995	+432.6	16.84	1.57	3	41.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	M
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
Apr.	1	h m s	s	" ' "	"								
	4	24	13.08	+1.830	+21 9 50.6	+4.61	0.745 1983	+442.8	16.92	1.58	3		
	2	4	24 57.22	1.848	21 11 41.3	4.61	0.746 2550	437.8	16.88	1.58	3		
	3	4	25 41.80	1.866	21 13 32.1	4.62	0.747 2995	432.6	16.84	1.57	3		
	4	4	26 26.81	1.884	21 15 23.1	4.62	0.748 3317	427.5	16.80	1.57	3		
	5	4	27 12.25	1.902	21 17 14.1	4.63	0.749 3517	422.4	16.76	1.57	3		
	6	4	27 58.11	+1.920	+21 19 5.2	+4.63	0.750 3592	+417.2	16.72	1.56	3		
	7	4	28 44.39	1.937	21 20 56.2	4.62	0.751 3543	412.0	16.68	1.56	3		
	8	4	29 31.09	1.954	21 22 47.2	4.62	0.752 3369	406.7	16.65	1.56	3		
	9	4	30 18.18	1.970	21 24 38.1	4.62	0.753 3066	401.4	16.61	1.55	3		
	10	4	31 5.67	1.987	21 26 28.9	4.61	0.754 2635	396.0	16.57	1.55	3		
	11	4	31 53.55	+2.003	+21 28 19.5	+4.60	0.755 2073	+390.5	16.54	1.55	3		
	12	4	32 41.82	2.019	21 30 9.9	4.60	0.756 1380	385.0	16.50	1.54	3		
	13	4	33 30.45	2.034	21 32 0.1	4.59	0.757 0555	379.5	16.47	1.54	3		
	14	4	34 19.45	2.049	21 33 50.0	4.57	0.757 9598	374.0	16.43	1.54	3		
	15	4	35 8.81	2.064	21 35 39.6	4.56	0.758 8509	368.5	16.40	1.53	3		
	16	4	35 58.52	+2.078	+21 37 28.9	+4.55	0.759 7286	+362.9	16.37	1.53	3		
	17	4	36 48.57	2.092	21 39 17.9	4.53	0.760 5929	357.3	16.33	1.53	2		
	18	4	37 38.96	2.106	21 41 6.4	4.51	0.761 4438	351.7	16.30	1.52	2		
	19	4	38 29.68	2.120	21 42 54.5	4.49	0.762 2813	346.2	16.27	1.52	2		
	20	4	39 20.72	2.133	21 44 42.1	4.47	0.763 1054	340.6	16.24	1.52	2		
	21	4	40 12.08	+2.146	+21 46 29.2	+4.45	0.763 9159	+334.9	16.21	1.52	2		
	22	4	41 3.74	2.158	21 48 15.7	4.43	0.764 7129	329.3	16.18	1.51	2		
	23	4	41 55.71	2.171	21 50 1.7	4.41	0.765 4964	323.6	16.15	1.51	2		
	24	4	42 47.97	2.184	21 51 47.2	4.38	0.766 2663	318.0	16.12	1.51	2		
	25	4	43 40.52	2.196	21 53 32.0	4.35	0.767 0226	312.3	16.09	1.50	2		
	26	4	44 33.36	+2.207	+21 55 16.1	+4.32	0.767 7653	+306.6	16.07	1.50	2		
	27	4	45 26.48	2.219	21 56 59.6	4.30	0.768 4945	301.0	16.04	1.50	2		
	28	4	46 19.88	2.230	21 58 42.4	4.27	0.769 2101	295.3	16.01	1.50	2		
	29	4	47 13.54	2.241	22 0 24.4	4.23	0.769 9121	289.6	15.99	1.49	2		
30	4	48 7.46	2.252	22 2 5.6	4.20	0.770 6004	283.9	15.96	1.49	2			
May	1	4 49 1.65	+2.263	+22 3 46.1	+4.17	0.771 2750	+278.2	15.94	1.49	2			
	2	4 49 56.09	2.273	22 5 25.8	4.14	0.771 9358	272.5	15.91	1.49	2			
	3	4 50 50.77	2.283	22 7 4.7	4.10	0.772 5828	266.7	15.89	1.49	2			
	4	4 51 45.69	2.294	22 8 42.7	4.06	0.773 2160	261.0	15.87	1.48	2			
	5	4 52 40.86	2.303	22 10 19.8	4.03	0.773 8354	255.2	15.84	1.48	2			
	6	4 53 36.25	+2.313	+22 11 56.0	+3.99	0.774 4408	+249.4	15.82	1.48	1			
	7	4 54 31.87	2.322	22 13 31.3	3.95	0.775 0323	243.5	15.80	1.48	1			
	8	4 55 27.70	2.331	22 15 5.6	3.91	0.775 6097	237.7	15.78	1.47	1			
	9	4 56 23.76	2.340	22 16 38.9	3.87	0.776 1731	231.8	15.76	1.47	1			
	10	4 57 20.02	2.349	22 18 11.2	3.82	0.776 7224	225.9	15.74	1.47	1			
	11	4 58 16.49	+2.357	+22 19 42.5	+3.78	0.777 2575	+220.0	15.72	1.47	1			
	12	4 59 13.14	2.364	22 21 12.8	3.74	0.777 7784	214.1	15.70	1.47	1			
	13	5 0 9.98	2.372	22 22 42.0	3.69	0.778 2852	208.2	15.68	1.47	1			
	14	5 1 7.00	2.380	22 24 10.1	3.65	0.778 7779	202.3	15.66	1.46	1			
	15	5 2 4.20	2.387	22 25 37.0	3.60	0.779 2563	196.4	15.65	1.46	1			
	16	5 3 1.56	+2.394	+22 27 2.9	+3.55	0.779 7206	+190.5	15.63	1.46	1			
	17	5 3 59.09	+2.400	+22 28 27.6	+3.51	0.780 1707	+184.6	15.61	1.46	1			

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
ay 17	5 3 59.09	+2.400	+22 28 27.6	+3.51	0.780 1707	+184.6	15.81	1.46	1 26.3
18	5 4 56.77	2.406	22 29 51.2	3.46	0.780 6067	178.7	15.80	1.46	1 23.3
19	5 5 54.60	2.412	22 31 13.5	3.41	0.781 0286	172.9	15.58	1.46	1 20.4
20	5 6 52.57	2.418	22 32 34.7	3.36	0.781 4364	167.0	15.57	1.46	1 17.4
21	5 7 50.68	2.424	22 33 54.7	3.31	0.781 8301	161.1	15.55	1.45	1 14.4
22	5 8 48.93	+2.430	+22 35 13.5	+3.26	0.782 2097	+155.2	15.54	1.45	1 11.5
23	5 9 47.31	2.435	22 36 31.0	3.20	0.782 5751	149.3	15.53	1.45	1 8.5
24	5 10 45.81	2.440	22 37 47.3	3.15	0.782 9265	143.5	15.52	1.45	1 5.5
25	5 11 44.43	2.445	22 39 2.3	3.10	0.783 2637	137.6	15.50	1.45	1 2.6
26	5 12 43.16	2.449	22 40 16.0	3.04	0.783 5869	131.7	15.49	1.45	0 59.6
27	5 13 42.00	+2.454	+22 41 28.4	+2.99	0.783 8960	+125.9	15.48	1.45	0 56.7
28	5 14 40.95	2.458	22 42 39.4	2.93	0.784 1910	120.0	15.47	1.45	0 53.7
29	5 15 40.00	2.462	22 43 49.2	2.88	0.784 4720	114.2	15.46	1.45	0 50.8
30	5 16 39.14	2.466	22 44 57.6	2.82	0.784 7390	108.3	15.45	1.44	0 47.8
31	5 17 38.37	2.470	22 46 4.6	2.76	0.784 9919	102.5	15.44	1.44	0 44.9
une 1	5 18 37.69	+2.473	+22 47 10.3	+2.71	0.785 2309	+96.6	15.43	1.44	0 41.9
2	5 19 37.09	2.477	22 48 14.7	2.65	0.785 4557	90.7	15.42	1.44	0 39.0
3	5 20 36.57	2.480	22 49 17.6	2.59	0.785 6663	84.8	15.42	1.44	0 36.0
4	5 21 36.12	2.482	22 50 19.2	2.54	0.785 8627	78.9	15.41	1.44	0 33.1
5	5 22 35.73	2.485	22 51 19.3	2.48	0.786 0449	73.0	15.40	1.44	0 30.1
6	5 23 35.41	+2.487	+22 52 18.0	+2.42	0.786 2129	+67.0	15.40	1.44	0 27.2
7	5 24 35.13	2.490	22 53 15.3	2.36	0.786 3666	61.1	15.39	1.44	0 24.2
8	5 25 34.91	2.491	22 54 11.2	2.30	0.786 5060	55.1	15.39	1.44	0 21.3
9	5 26 34.72	2.493	22 55 5.7	2.24	0.786 6311	49.2	15.38	1.44	0 18.4
10	5 27 34.57	2.495	22 55 58.7	2.18	0.786 7420	43.2	15.38	1.44	0 15.4
11	5 28 34.46	+2.496	+22 56 50.3	+2.12	0.786 8385	+37.3	15.38	1.44	0 12.5
12	5 29 34.36	2.497	22 57 40.4	2.06	0.786 9208	31.3	15.37	1.44	0 9.5
13	5 30 34.28	2.497	22 58 29.1	2.00	0.786 9889	25.4	15.37	1.44	0 6.6
14	5 31 34.21	2.497	22 59 16.3	1.94	0.787 0428	19.5	15.37	1.44	0 3.7
15	5 32 34.15	2.497	23 0 2.1	1.88	0.787 0826	13.6	15.37	1.44	0 0.7
16	5 33 34.09	+2.497	+23 0 46.5	+1.82	0.787 1082	+7.7	15.37	1.44	23 54.9
17	5 34 34.03	2.497	23 1 29.4	1.76	0.787 1196	+1.8	15.37	1.44	23 51.9
18	5 35 33.96	2.497	23 2 10.8	1.69	0.787 1169	-4.0	15.37	1.44	23 49.0
19	5 36 33.87	2.496	23 2 50.7	1.63	0.787 1002	9.9	15.37	1.44	23 46.1
20	5 37 33.76	2.495	23 3 29.2	1.57	0.787 0694	15.8	15.37	1.44	23 43.1
21	5 38 33.63	+2.494	+23 4 6.1	+1.51	0.787 0246	-21.6	15.37	1.44	23 40.2
22	5 39 33.47	2.492	23 4 41.6	1.45	0.786 9658	27.4	15.37	1.44	23 37.2
23	5 40 33.27	2.491	23 5 15.7	1.39	0.786 8930	33.2	15.37	1.44	23 34.3
24	5 41 33.04	2.489	23 5 48.2	1.32	0.786 8062	39.1	15.38	1.44	23 31.3
25	5 42 32.76	2.487	23 6 19.3	1.26	0.786 7055	44.9	15.38	1.44	23 28.4
26	5 43 32.44	+2.485	+23 6 48.9	+1.20	0.786 5908	-50.7	15.38	1.44	23 25.5
27	5 44 32.06	2.483	23 7 17.1	1.14	0.786 4621	56.5	15.39	1.44	23 22.5
28	5 45 31.63	2.481	23 7 43.7	1.08	0.786 3195	62.3	15.39	1.44	23 19.6
29	5 46 31.13	2.478	23 8 8.9	1.02	0.786 1629	68.2	15.40	1.44	23 16.6
30	5 47 30.58	2.475	23 8 32.6	0.96	0.785 9922	74.0	15.41	1.44	23 13.7
uly 1	5 48 29.95	+2.472	+23 8 54.9	+0.90	0.785 8075	-79.9	15.41	1.44	23 10.7
2	5 49 29.25	+2.469	+23 9 15.7	+0.84	0.785 6088	-85.7	15.42	1.44	23 7.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
July	1	h	m	s	s	"	"	"	"		"	"	
	2	5	48	29.95	+2.472	+23	8	54.9	+0.90	0.785 8075	-79.9	15.41	1.44
	3	5	49	29.25	2.469	23	9	15.7	0.84	0.785 6088	85.7	15.42	1.44
	4	5	50	28.46	2.465	23	9	35.1	0.78	0.785 3961	91.5	15.43	1.44
	5	5	51	27.59	2.462	23	9	53.1	0.72	0.785 1695	97.4	15.44	1.44
	6	5	52	26.62	2.457	23	10	9.6	0.66	0.784 9288	103.2	15.44	1.44
	7	5	53	25.55	+2.453	+23	10	24.7	+0.60	0.784 6741	-109.0	15.45	1.44
	8	5	54	24.37	2.449	23	10	38.3	0.54	0.784 4054	114.9	15.46	1.45
	9	5	55	23.08	2.444	23	10	50.5	0.48	0.784 1225	120.8	15.47	1.45
	10	5	56	21.68	2.439	23	11	1.3	0.42	0.783 8255	126.7	15.48	1.45
	11	5	57	20.15	2.433	23	11	10.8	0.36	0.783 5144	132.5	15.49	1.45
	12	5	58	18.48	+2.428	+23	11	18.8	+0.31	0.783 1894	-138.3	15.51	1.45
	13	5	59	16.68	2.422	23	11	25.5	0.25	0.782 8505	144.1	15.52	1.45
	14	6	0	14.74	2.416	23	11	30.8	0.19	0.782 4977	149.9	15.53	1.45
	15	6	1	12.65	2.410	23	11	34.7	0.14	0.782 1311	155.6	15.54	1.45
	16	6	2	10.41	2.403	23	11	37.3	0.08	0.781 7506	161.4	15.56	1.45
	17	6	3	8.01	+2.396	+23	11	38.6	+0.02	0.781 3563	-167.1	15.57	1.46
	18	6	4	5.44	2.389	23	11	38.5	-0.03	0.780 9483	172.9	15.59	1.46
	19	6	5	2.70	2.382	23	11	37.2	0.08	0.780 5266	178.6	15.60	1.46
	20	6	5	59.78	2.375	23	11	34.5	0.14	0.780 0911	184.3	15.62	1.46
	21	6	6	56.68	2.367	23	11	30.6	0.19	0.779 6420	190.0	15.63	1.46
	22	6	7	53.40	+2.359	+23	11	25.4	-0.24	0.779 1793	-195.6	15.65	1.46
	23	6	8	49.93	2.351	23	11	18.9	0.30	0.778 7031	201.2	15.67	1.46
	24	6	9	46.26	2.343	23	11	11.2	0.35	0.778 2133	206.9	15.68	1.47
	25	6	10	42.39	2.335	23	11	2.3	0.40	0.777 7100	212.5	15.70	1.47
	26	6	11	38.32	2.326	23	10	52.1	0.45	0.777 1932	218.1	15.72	1.47
	27	6	12	34.04	+2.317	+23	10	40.7	-0.50	0.776 6629	-223.8	15.74	1.47
	28	6	13	29.55	2.308	23	10	28.2	0.55	0.776 1190	229.4	15.76	1.47
	29	6	14	24.84	2.299	23	10	14.5	0.59	0.775 5616	235.1	15.78	1.48
	30	6	15	19.90	2.289	23	9	59.7	0.64	0.774 9907	240.7	15.80	1.48
	31	6	16	14.73	2.279	23	9	43.7	0.69	0.774 4063	246.3	15.82	1.48
Aug.	1	6	17	9.31	+2.269	+23	9	26.6	-0.74	0.773 8084	-251.9	15.84	1.48
	2	6	18	3.65	2.259	23	9	8.3	0.78	0.773 1970	257.6	15.87	1.48
	3	6	18	57.74	2.248	23	8	49.0	0.82	0.772 5720	263.2	15.89	1.49
	4	6	19	51.57	2.237	23	8	28.7	0.87	0.771 9336	268.8	15.91	1.49
	5	6	20	45.14	2.226	23	8	7.3	0.91	0.771 2818	274.4	15.94	1.49
	6	6	21	38.43	+2.215	+23	7	44.9	-0.95	0.770 6166	-280.0	15.96	1.49
	7	6	22	31.45	2.203	23	7	21.6	0.99	0.769 9380	285.5	15.99	1.49
	8	6	23	24.18	2.191	23	6	57.3	1.03	0.769 2461	291.0	16.01	1.50
	9	6	24	16.61	2.178	23	6	32.1	1.07	0.768 5410	296.5	16.04	1.50
	10	6	25	8.74	2.166	23	6	5.9	1.11	0.767 8228	302.0	16.06	1.50
	11	6	26	0.57	+2.153	+23	5	38.8	-1.15	0.767 0914	-307.5	16.09	1.50
	12	6	26	52.09	2.140	23	5	10.9	1.18	0.766 3470	312.9	16.12	1.51
	13	6	27	43.28	2.126	23	4	42.1	1.22	0.765 5897	318.2	16.15	1.51
	14	6	28	34.15	2.112	23	4	12.5	1.25	0.764 8195	323.6	16.18	1.51
	15	6	29	24.68	2.099	23	3	42.2	1.28	0.764 0365	328.9	16.20	1.51
	16	6	30	14.88	+2.084	+23	3	11.0	-1.31	0.763 2408	-334.2	16.23	1.52
17	6	31	4.73	+2.070	+23	2	39.1	-1.35	0.762 4324	-339.5	16.26	1.52	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	Noon.
	h	m	s	s	°	'	"	"			"	"	h m
16	6	31	4.73	+2.070	+23	2	39.1	-1.35	0.762 4324	-339.5	16.26	1.52	20 52.1
17	6	31	54.23	2.055	23	2	6.4	1.38	0.761 6113	344.7	16.30	1.52	20 49.0
18	6	32	43.38	2.040	23	1	33.1	1.40	0.760 7776	350.0	16.33	1.53	20 45.8
19	6	33	32.16	2.025	23	0	59.1	1.43	0.759 9315	355.1	16.36	1.53	20 42.7
20	6	34	20.58	2.010	23	0	24.4	1.46	0.759 0730	360.3	16.39	1.53	20 39.6
21	6	35	8.62	+1.994	+22	59	49.1	-1.48	0.758 2023	-365.3	16.42	1.54	20 36.4
22	6	35	56.29	1.978	22	59	13.2	1.51	0.757 3194	370.4	16.46	1.54	20 33.3
23	6	36	43.57	1.962	22	58	36.8	1.53	0.756 4243	375.5	16.49	1.54	20 30.1
24	6	37	30.45	1.945	22	57	59.9	1.55	0.755 5170	380.6	16.53	1.54	20 27.0
25	6	38	16.94	1.929	22	57	22.4	1.57	0.754 5973	385.7	16.56	1.55	20 23.8
26	6	39	3.03	+1.912	+22	56	44.4	-1.59	0.753 6655	-390.7	16.60	1.55	20 20.7
27	6	39	48.70	1.894	22	56	6.0	1.61	0.752 7218	395.7	16.63	1.55	20 17.5
28	6	40	33.95	1.877	22	55	27.2	1.62	0.751 7663	400.6	16.67	1.56	20 14.3
29	6	41	18.78	1.859	22	54	48.0	1.64	0.750 7987	405.6	16.71	1.56	20 11.1
30	6	42	3.17	1.840	22	54	8.3	1.66	0.749 8192	410.6	16.74	1.57	20 7.9
pt. 31	6	42	47.12	+1.822	+22	53	28.4	-1.67	0.748 8280	-415.4	16.78	1.57	20 4.7
1	6	43	30.61	1.803	22	52	48.2	1.68	0.747 8252	420.2	16.82	1.57	20 1.5
2	6	44	13.65	1.784	22	52	7.7	1.69	0.746 8108	425.0	16.86	1.58	19 58.2
3	6	44	56.22	1.764	22	51	27.1	1.70	0.745 7850	429.8	16.90	1.58	19 55.0
4	6	45	38.31	1.744	22	50	46.2	1.71	0.744 7479	434.4	16.94	1.58	19 51.8
5	6	46	19.92	+1.724	+22	50	5.2	-1.71	0.743 6997	-439.1	16.98	1.59	19 48.5
6	6	47	1.04	1.703	22	49	24.1	1.72	0.742 6404	443.6	17.02	1.59	19 45.3
7	6	47	41.66	1.682	22	48	42.8	1.72	0.741 5703	448.1	17.06	1.60	19 42.0
8	6	48	21.78	1.661	22	48	1.5	1.72	0.740 4893	452.6	17.11	1.60	19 38.7
9	6	49	1.38	1.639	22	47	20.2	1.72	0.739 3978	457.0	17.15	1.60	19 35.4
10	6	49	40.46	+1.617	+22	46	38.9	-1.72	0.738 2958	-461.3	17.19	1.61	19 32.1
11	6	50	19.02	1.595	22	45	57.6	1.72	0.737 1835	465.6	17.24	1.61	19 28.8
12	6	50	57.04	1.573	22	45	16.5	1.71	0.736 0611	469.7	17.28	1.62	19 25.5
13	6	51	34.51	1.550	22	44	35.4	1.71	0.734 9287	473.9	17.33	1.62	19 22.2
14	6	52	11.44	1.527	22	43	54.5	1.70	0.733 7866	477.9	17.37	1.62	19 18.9
15	6	52	47.81	+1.504	+22	43	13.7	-1.69	0.732 6349	-481.8	17.42	1.63	19 15.6
16	6	53	23.62	1.480	22	42	33.2	1.68	0.731 4738	485.7	17.47	1.63	19 12.2
17	6	53	58.86	1.456	22	41	52.9	1.67	0.730 3033	489.6	17.51	1.64	19 8.9
18	6	54	33.53	1.432	22	41	12.9	1.66	0.729 1238	493.3	17.56	1.64	19 5.5
19	6	55	7.61	1.408	22	40	33.2	1.65	0.727 9353	497.0	17.61	1.65	19 2.1
20	6	55	41.10	+1.383	+22	39	53.8	-1.63	0.726 7380	-500.7	17.66	1.65	18 58.7
21	6	56	14.00	1.358	22	39	14.8	1.62	0.725 5320	504.3	17.71	1.66	18 55.3
22	6	56	46.30	1.333	22	38	36.2	1.60	0.724 3175	507.8	17.76	1.66	18 51.9
23	6	57	17.98	1.307	22	37	58.1	1.58	0.723 0947	511.2	17.81	1.66	18 48.5
24	6	57	49.05	1.281	22	37	20.4	1.56	0.721 8637	514.6	17.86	1.67	18 45.1
25	6	58	49.49	+1.255	+22	36	43.2	-1.54	0.720 6248	-517.9	17.91	1.67	18 41.7
26	6	58	49.29	1.228	22	36	6.6	1.51	0.719 3780	521.1	17.96	1.68	18 38.2
27	6	59	18.45	1.201	22	35	30.5	1.49	0.718 1237	524.2	18.01	1.68	18 34.8
28	6	59	46.96	1.174	22	34	55.1	1.46	0.716 8620	527.2	18.06	1.69	18 31.3
29	7	0	14.80	1.146	22	34	20.3	1.44	0.715 5932	530.1	18.12	1.69	18 27.8
30	7	0	41.97	+1.118	+22	33	46.2	-1.40	0.714 3176	-532.9	18.17	1.70	18 24.3
Oct. 1	7	1	8.47	+1.090	+22	33	12.9	-1.37	0.713 0355	-535.5	18.22	1.70	18 20.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- ax.	Transit Meridian of Green- wich.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.		
Oct.	h	m	s	s	°	'	"	"			"	"	h	m
	1	7	1	8.47	+1.090	+22	33	12.9	-1.37	0.713 0355	-535.5	18.22	1.70	18 20.8
	2	7	1	34.28	1.061	22	32	40.4	1.34	0.711 7470	538.1	18.28	1.71	18 17.3
	3	7	1	59.39	1.032	22	32	8.6	1.31	0.710 4524	540.6	18.33	1.71	18 13.8
	4	7	2	23.80	1.002	22	31	37.7	1.27	0.709 1521	542.9	18.39	1.72	18 10.3
	5	7	2	47.50	0.973	22	31	7.6	1.24	0.707 8463	545.2	18.44	1.72	18 6.7
	6	7	3	10.48	+0.942	+22	30	38.4	-1.20	0.706 5354	-547.2	18.50	1.73	18 3.2
	7	7	3	32.74	0.912	22	30	10.1	1.16	0.705 2196	549.2	18.56	1.73	17 59.6
	8	7	3	54.27	0.882	22	29	42.8	1.12	0.703 8994	551.0	18.61	1.74	17 56.0
	9	7	4	15.06	0.851	22	29	16.5	1.08	0.702 5751	552.6	18.67	1.75	17 52.4
	10	7	4	35.11	0.820	22	28	51.2	1.03	0.701 2470	554.1	18.73	1.75	17 48.8
	11	7	4	54.40	+0.788	+22	28	27.0	-0.99	0.699 9153	-555.5	18.78	1.76	17 45.2
	12	7	5	12.94	0.756	22	28	3.9	0.94	0.698 5805	556.8	18.84	1.76	17 41.5
	13	7	5	30.71	0.725	22	27	41.8	0.90	0.697 2428	557.9	18.90	1.77	17 37.9
	14	7	5	47.72	0.693	22	27	20.8	0.85	0.695 9028	558.8	18.96	1.77	17 34.2
	15	7	6	3.95	0.660	22	27	1.0	0.80	0.694 5607	559.6	19.02	1.78	17 30.5
	16	7	6	19.41	+0.628	+22	26	42.3	-0.75	0.693 2169	-560.2	19.07	1.78	17 26.8
	17	7	6	34.08	0.595	22	26	24.8	0.70	0.691 8717	560.7	19.13	1.79	17 23.1
	18	7	6	47.96	0.562	22	26	8.5	0.65	0.690 5256	561.0	19.19	1.79	17 19.4
	19	7	7	1.05	0.529	22	25	53.5	0.60	0.689 1788	561.3	19.25	1.80	17 15.7
	20	7	7	13.34	0.495	22	25	39.7	0.55	0.687 8315	561.4	19.31	1.81	17 12.0
	21	7	7	24.83	+0.462	+22	25	27.2	-0.50	0.686 4843	-561.2	19.37	1.81	17 8.2
	22	7	7	35.51	0.428	22	25	15.9	0.44	0.685 1377	560.9	19.43	1.82	17 4.5
	23	7	7	45.37	0.394	22	25	6.0	0.39	0.683 7919	560.5	19.49	1.82	17 0.7
	24	7	7	54.41	0.359	22	24	57.4	0.33	0.682 4471	560.0	19.55	1.83	16 56.9
	25	7	8	2.62	0.325	22	24	50.2	0.27	0.681 1041	559.1	19.61	1.83	16 53.1
	26	7	8	9.99	+0.290	+22	24	44.4	-0.21	0.679 7633	-558.1	19.67	1.84	16 49.3
	27	7	8	16.53	0.255	22	24	39.9	0.16	0.678 4251	557.0	19.74	1.84	16 45.4
	28	7	8	22.22	0.220	22	24	36.9	0.09	0.677 0898	555.7	19.80	1.85	16 41.6
	29	7	8	27.07	0.184	22	24	35.4	-0.03	0.675 7581	554.1	19.86	1.86	16 37.7
	30	7	8	31.06	0.149	22	24	35.3	+0.02	0.674 4305	552.2	19.92	1.86	16 33.9
	31	7	8	34.20	+0.113	+22	24	36.6	+0.09	0.673 1075	-550.2	19.98	1.87	16 30.0
Nov.	1	7	8	36.48	0.077	22	24	39.4	0.15	0.671 7894	548.1	20.04	1.87	16 26.1
	2	7	8	37.90	0.041	22	24	43.6	0.21	0.670 4769	545.6	20.10	1.88	16 22.2
	3	7	8	38.46	+0.005	22	24	49.3	0.27	0.669 1706	542.9	20.16	1.88	16 18.2
	4	7	8	38.15	-0.031	22	24	56.4	0.33	0.667 8711	540.0	20.22	1.89	16 14.2
	5	7	8	36.98	-0.067	+22	25	5.0	+0.39	0.666 5788	-536.9	20.28	1.90	16 10.3
	6	7	8	34.94	0.103	22	25	15.1	0.45	0.665 2943	533.5	20.34	1.90	16 6.3
	7	7	8	32.04	0.139	22	25	26.7	0.51	0.664 0182	529.9	20.40	1.91	16 2.3
	8	7	8	28.27	0.175	22	25	39.7	0.57	0.662 7510	526.1	20.46	1.91	15 58.3
	9	7	8	23.64	0.211	22	25	54.2	0.63	0.661 4933	522.0	20.52	1.92	15 54.3
	10	7	8	18.15	-0.247	+22	26	10.1	+0.69	0.660 2457	-517.6	20.58	1.92	15 50.3
	11	7	8	11.80	0.282	22	26	27.4	0.75	0.659 0086	513.1	20.64	1.93	15 46.2
	12	7	8	4.60	0.318	22	26	46.1	0.81	0.657 7828	508.3	20.70	1.94	15 42.2
	13	7	7	56.54	0.353	22	27	6.3	0.87	0.656 5687	503.3	20.75	1.94	15 38.1
	14	7	7	47.64	0.389	22	27	27.8	0.92	0.655 3670	498.1	20.81	1.95	15 34.0
	15	7	7	37.89	-0.424	+22	27	50.7	+0.98	0.654 1780	-492.7	20.87	1.95	15 29.9
	16	7	7	27.30	-0.459	+22	28	15.0	+1.04	0.653 0025	-486.9	20.93	1.96	15 25.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	''							h	m
ov. 16	7	7	27.30	-0.459	+22	28	15.0	+1.04	0.653 0025	-486.9	20.93	1.96	15 25.8
17	7	7	15.88	0.493	22	28	40.6	1.09	0.651 8408	481.1	20.98	1.96	15 21.7
18	7	7	3.63	0.528	22	29	7.5	1.15	0.650 6936	474.9	21.04	1.97	15 17.5
19	7	6	50.55	0.562	22	29	35.8	1.20	0.649 5613	468.6	21.09	1.97	15 13.4
20	7	6	36.65	0.596	22	30	5.3	1.26	0.648 4447	461.9	21.15	1.98	15 9.2
21	7	6	21.94	-0.630	+22	30	36.1	+1.31	0.647 3441	-455.1	21.20	1.98	15 5.0
22	7	6	6.41	0.664	22	31	8.2	1.36	0.646 2603	448.0	21.25	1.99	15 0.8
23	7	5	50.08	0.697	22	31	41.5	1.41	0.645 1938	440.7	21.31	1.99	14 56.6
24	7	5	32.95	0.730	22	32	16.0	1.46	0.644 1453	433.0	21.36	2.00	14 52.4
25	7	5	15.04	0.763	22	32	51.7	1.51	0.643 1154	425.2	21.41	2.00	14 48.1
26	7	4	56.34	-0.795	+22	33	28.4	+1.55	0.642 1047	-417.1	21.46	2.01	14 43.9
27	7	4	36.87	0.827	22	34	6.3	1.60	0.641 1137	408.7	21.51	2.01	14 39.6
28	7	4	16.64	0.859	22	34	45.2	1.64	0.640 1432	400.1	21.55	2.02	14 35.4
29	7	3	55.66	0.889	22	35	25.2	1.69	0.639 1937	391.2	21.60	2.02	14 31.1
30	7	3	33.95	0.920	22	36	6.1	1.73	0.638 2657	382.1	21.65	2.02	14 26.8
ec. 1	7	3	11.51	-0.950	+22	36	48.0	+1.76	0.637 3600	-372.7	21.69	2.03	14 22.5
2	7	2	48.37	0.979	22	37	30.8	1.80	0.636 4770	363.1	21.74	2.03	14 18.2
3	7	2	24.53	1.007	22	38	14.5	1.84	0.635 6175	353.2	21.78	2.04	14 13.8
4	7	2	0.02	1.035	22	38	59.0	1.87	0.634 7819	343.1	21.82	2.04	14 9.5
5	7	1	34.84	1.063	22	39	44.2	1.90	0.633 9709	332.7	21.86	2.04	14 5.1
6	7	1	9.01	-1.089	+22	40	30.2	+1.93	0.633 1849	-322.2	21.90	2.05	14 0.8
7	7	0	42.55	1.115	22	41	16.9	1.96	0.632 4245	311.4	21.94	2.05	13 56.4
8	7	0	15.48	1.140	22	42	4.2	1.98	0.631 6901	300.5	21.98	2.05	13 52.0
9	6	59	47.82	1.164	22	42	52.1	2.01	0.630 9822	289.4	22.01	2.06	13 47.6
10	6	59	19.59	1.188	22	43	40.5	2.03	0.630 3014	278.0	22.05	2.06	13 43.2
11	6	58	50.81	-1.210	+22	44	29.4	+2.05	0.629 6480	-266.5	22.08	2.06	13 38.8
12	6	58	21.50	1.232	22	45	18.7	2.06	0.629 0225	254.7	22.11	2.07	13 34.4
13	6	57	51.69	1.253	22	46	8.5	2.08	0.628 4253	242.9	22.14	2.07	13 29.9
14	6	57	21.38	1.273	22	46	58.5	2.09	0.627 8568	230.9	22.17	2.07	13 25.5
15	6	56	50.61	1.292	22	47	48.8	2.10	0.627 3173	218.7	22.20	2.08	13 21.0
16	6	56	19.39	-1.310	+22	48	39.4	+2.11	0.626 8072	-206.4	22.23	2.08	13 16.6
17	6	55	47.74	1.327	22	49	30.2	2.12	0.626 3269	193.9	22.25	2.08	13 12.1
18	6	55	15.69	1.343	22	50	21.1	2.12	0.625 8766	181.3	22.27	2.08	13 7.7
19	6	54	43.26	1.359	22	51	12.2	2.13	0.625 4567	168.6	22.30	2.08	13 3.2
20	6	54	10.46	1.374	22	52	3.3	2.13	0.625 0675	155.7	22.32	2.09	12 58.7
21	6	53	37.33	-1.387	+22	52	54.4	+2.13	0.624 7092	-142.8	22.33	2.09	12 54.2
22	6	53	3.89	1.399	22	53	45.5	2.13	0.624 3822	129.7	22.35	2.09	12 49.7
23	6	52	30.16	1.411	22	54	36.5	2.12	0.624 0867	116.5	22.37	2.09	12 45.2
24	6	51	56.17	1.421	22	55	27.4	2.12	0.623 8230	103.2	22.38	2.09	12 40.7
25	6	51	21.94	1.431	22	56	18.1	2.11	0.623 5913	89.8	22.39	2.09	12 36.2
26	6	50	47.49	-1.439	+22	57	8.7	+2.10	0.623 3919	-76.3	22.40	2.09	12 31.7
27	6	50	12.86	1.446	22	57	59.1	2.10	0.623 2251	62.7	22.41	2.09	12 27.2
28	6	49	38.07	1.453	22	58	49.3	2.08	0.623 0909	49.1	22.42	2.10	12 22.7
29	6	49	3.14	1.458	22	59	39.1	2.07	0.622 9895	35.4	22.42	2.10	12 18.2
30	6	48	28.10	1.461	23	0	28.6	2.05	0.622 9210	21.7	22.43	2.10	12 13.7
31	6	47	52.99	-1.464	+23	1	17.6	+2.03	0.622 8855	-7.9	22.43	2.10	12 9.2
32	6	47	17.82	....	+23	2	6.1	....	0.622 8830	....	22.43	2.10	12 4

FOR GREENWICH MEAN NOON.

Date.	Helio- centric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Helio- centric Latitude.	Var. per Day.	Logarithm of Radius Vector.
	° ' "	" "	"	° ' "	"	
Jan.	0 69 16 24.1	5 16.56	-23.4	-0 39 38.2	+6.24	0.703 7400
	4 69 37 30.0	5 16.41	23.3	0 39 13.2	6.26	0.703 8436
	8 69 58 35.4	5 16.26	23.1	0 38 48.1	6.28	0.703 9476
	12 70 19 40.1	5 16.10	22.9	0 38 23.0	6.30	0.704 0519
	16 70 40 44.2	5 15.95	22.8	0 37 57.7	6.32	0.704 1566
	20 71 1 47.7	5 15.80	-22.6	-0 37 32.4	+6.34	0.704 2617
	24 71 22 50.6	5 15.65	22.4	0 37 7.0	6.35	0.704 3672
	28 71 43 52.9	5 15.50	22.2	0 36 41.6	6.38	0.704 4730
Feb.	1 72 4 54.6	5 15.34	22.0	0 36 16.0	6.40	0.704 5793
	5 72 25 55.6	5 15.18	21.8	0 35 50.4	6.40	0.704 6858
	9 72 46 56.0	5 15.02	-21.6	-0 35 24.8	+6.41	0.704 7928
	13 73 7 55.8	5 14.87	21.5	0 34 59.1	6.44	0.704 9001
	17 73 28 55.0	5 14.71	21.3	0 34 33.3	6.45	0.705 0078
	21 73 49 53.5	5 14.55	21.1	0 34 7.5	6.46	0.705 1157
	25 74 10 51.4	5 14.40	20.9	0 33 41.6	6.48	0.705 2241
Mar.	1 74 31 48.7	5 14.25	-20.7	-0 33 15.6	+6.50	0.705 3327
	5 74 52 45.4	5 14.09	20.4	0 32 49.6	6.51	0.705 4418
	9 75 13 41.4	5 13.93	20.2	0 32 23.5	6.54	0.705 5511
	13 75 34 36.8	5 13.76	20.0	0 31 57.3	6.55	0.705 6608
	17 75 55 31.5	5 13.60	19.8	0 31 31.1	6.55	0.705 7708
	21 76 16 25.6	5 13.44	-19.6	-0 31 4.9	+6.56	0.705 8811
	25 76 37 19.0	5 13.28	19.3	0 30 38.6	6.59	0.705 9917
	29 76 58 11.8	5 13.12	19.1	0 30 12.2	6.60	0.706 1026
Apr.	2 77 19 4.0	5 12.96	18.9	0 29 45.8	6.61	0.706 2138
	6 77 39 55.5	5 12.80	18.6	0 29 19.3	6.62	0.706 3254
	10 78 0 46.4	5 12.64	-18.4	-0 28 52.8	+6.64	0.706 4372
	14 78 21 36.6	5 12.48	18.1	0 28 26.2	6.66	0.706 5493
	18 78 42 26.2	5 12.31	17.9	0 27 59.5	6.68	0.706 6617
	22 79 3 15.1	5 12.15	17.7	0 27 32.8	6.68	0.706 7744
	26 79 24 3.4	5 11.99	17.4	0 27 6.1	6.69	0.706 8873
	30 79 44 51.0	5 11.81	-17.2	-0 26 39.3	+6.70	0.707 0006
May	4 80 5 37.9	5 11.65	16.9	0 26 12.5	6.71	0.707 1141
	8 80 26 24.2	5 11.50	16.7	0 25 45.6	6.72	0.707 2279
	12 80 47 9.9	5 11.34	16.4	0 25 18.7	6.72	0.707 3419
	16 81 7 54.9	5 11.16	16.2	0 24 51.8	6.74	0.707 4562
	20 81 28 39.2	5 11.00	-15.9	-0 24 24.8	+6.75	0.707 5707
	24 81 49 22.9	5 10.85	15.6	0 23 57.8	6.76	0.707 6855
	28 82 10 6.0	5 10.68	15.4	0 23 30.7	6.78	0.707 8005
June	1 82 30 48.3	5 10.50	15.1	0 23 3.6	6.78	0.707 9158
	5 82 51 30.0	5 10.33	14.8	0 22 36.5	6.78	0.708 0313
	9 83 12 11.1	5 10.18	-14.6	-0 22 9.4	+6.79	0.708 1470
	13 83 32 51.4	5 10.00	14.3	0 21 42.2	6.80	0.708 2629
	17 83 53 31.1	5 9.85	14.0	0 21 15.0	6.81	0.708 3790
	21 84 14 10.2	5 9.69	13.8	0 20 47.7	6.82	0.708 4954
	25 84 34 48.6	5 9.51	13.5	0 20 20.4	6.82	0.708 6120
	29 84 55 26.3	5 9.35	-13.2	-0 19 53.1	+6.84	0.708 7287
July	3 85 16 3.4	5 9.19	-12.9	-0 19 25.7	+6.85	0.708 8457

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" " "	" "	" "	" " "	" "		
y	3	85 16 3.4	5 9.19	-12.9	-0 19 25.7	+6.85	0.708 8457	+292.7
	7	85 36 39.8	5 9.01	12.6	0 18 58.3	6.85	0.708 9629	293.1
	11	85 57 15.5	5 8.85	12.3	0 18 30.9	6.85	0.709 0802	293.6
	15	86 17 50.6	5 8.68	12.1	0 18 3.5	6.86	0.709 1978	294.1
	19	86 38 24.9	5 8.50	11.8	0 17 36.0	6.86	0.709 3155	294.5
	23	86 58 58.6	5 8.35	-11.5	-0 17 8.6	+6.87	0.709 4334	+295.0
	27	87 19 31.7	5 8.18	11.2	0 16 41.1	6.88	0.709 5515	295.4
	31	87 40 4.0	5 8.00	10.9	0 16 13.6	6.89	0.709 6697	295.9
g.	4	88 0 35.7	5 7.85	10.6	0 15 46.0	6.90	0.709 7882	296.3
	8	88 21 6.8	5 7.69	10.3	0 15 18.4	6.90	0.709 9067	296.5
	12	88 41 37.2	5 7.52	-10.0	-0 14 50.8	+6.90	0.710 0254	+297.0
	16	89 2 6.9	5 7.34	9.7	0 14 23.2	6.90	0.710 1443	297.4
	20	89 22 35.9	5 7.16	9.4	0 13 55.6	6.90	0.710 2633	297.8
	24	89 43 4.2	5 7.00	9.1	0 13 28.0	6.91	0.710 3825	298.1
	28	90 3 31.9	5 6.83	8.8	0 13 0.3	6.91	0.710 5018	298.4
pt.	1	90 23 58.8	5 6.65	- 8.5	-0 12 32.7	+6.91	0.710 6212	+298.6
	5	90 44 25.1	5 6.50	8.2	0 12 5.0	6.91	0.710 7407	299.0
	9	91 4 50.8	5 6.33	7.9	0 11 37.4	6.91	0.710 8604	299.2
	13	91 25 15.7	5 6.15	7.6	0 11 9.7	6.92	0.710 9801	299.5
	17	91 45 40.0	5 5.99	7.3	0 10 42.0	6.92	0.711 1000	299.9
	21	92 6 3.6	5 5.82	- 7.0	-0 10 14.3	+6.92	0.711 2200	+300.1
	25	92 26 26.6	5 5.65	6.7	0 9 46.6	6.92	0.711 3401	300.4
	29	92 46 48.8	5 5.48	6.4	0 9 18.9	6.92	0.711 4603	300.6
rt.	3	93 7 10.4	5 5.32	6.1	0 8 51.2	6.92	0.711 5806	300.8
	7	93 27 31.4	5 5.15	5.8	0 8 23.5	6.92	0.711 7009	301.0
	11	93 47 51.6	5 4.98	- 5.4	-0 7 55.8	+6.92	0.711 8214	+301.4
	15	94 8 11.2	5 4.80	5.1	0 7 28.1	6.93	0.711 9420	301.5
	19	94 28 30.0	5 4.63	4.8	0 7 0.4	6.93	0.712 0626	301.6
	23	94 48 48.2	5 4.46	4.5	0 6 32.6	6.93	0.712 1833	301.9
	27	95 9 5.8	5 4.30	4.2	0 6 4.9	6.93	0.712 3041	302.1
	31	95 29 22.6	5 4.12	- 3.9	-0 5 37.2	+6.93	0.712 4250	+302.2
v.	4	95 49 38.8	5 3.96	3.6	0 5 9.5	6.92	0.712 5459	302.4
	8	96 9 54.3	5 3.79	3.3	0 4 41.8	6.92	0.712 6669	302.5
	12	96 30 9.1	5 3.61	3.0	0 4 14.0	6.92	0.712 7879	302.6
	16	96 50 23.2	5 3.45	2.7	0 3 46.4	6.92	0.712 9090	302.9
	20	97 10 36.7	5 3.29	- 2.4	-0 3 18.7	+6.92	0.713 0302	+303.0
	24	97 30 49.5	5 3.11	2.0	0 2 51.1	6.92	0.713 1514	303.0
	28	97 51 1.6	5 2.95	1.7	0 2 23.4	6.92	0.713 2726	303.1
c.	2	98 11 13.1	5 2.78	1.4	0 1 55.7	6.92	0.713 3939	303.2
	6	98 31 23.8	5 2.60	1.1	0 1 28.0	6.91	0.713 5152	303.2
	10	98 51 33.9	5 2.44	- 0.7	-0 1 0.4	+6.91	0.713 6365	+303.2
	14	99 11 43.3	5 2.28	0.4	0 0 32.8	6.91	0.713 7578	303.4
	18	99 31 52.1	5 2.10	- 0.1	-0 0 5.2	6.90	0.713 8792	303.4
	22	99 52 0.1	5 1.92	+ 0.2	+0 0 22.4	6.90	0.714 0005	303.4
	26	100 12 7.5	5 1.76	0.5	0 0 50.0	6.89	0.714 1219	303.4
	30	100 32 14.2	5 1.59	+ 0.8	+0 1 17.5	+6.89	0.714 2432	+303.4
	34	100 52 20.2	5 1.42	+ 1.2	+0 1 45.0	+6.89	0.714 3646	+303.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	
Jan.	1	9	4	18.03	-0.607	+17	35	4.4	+3.00	0.918 0786	-196.7	9.35	1.06
	2	9	4	3.31	0.620	17	36	16.9	3.05	0.917 6131	191.1	9.36	1.06
	3	9	3	48.28	0.632	17	37	30.6	3.09	0.917 1611	185.5	9.37	1.06
	4	9	3	32.95	0.645	17	38	45.4	3.14	0.916 7226	179.8	9.38	1.07
	5	9	3	17.32	0.657	17	40	1.3	3.19	0.916 2980	174.0	9.39	1.07
	6	9	3	1.41	-0.669	+17	41	18.3	+3.23	0.915 8874	-168.1	9.40	1.07
	7	9	2	45.23	0.680	17	42	36.3	3.27	0.915 4911	162.1	9.41	1.07
	8	9	2	28.77	0.691	17	43	55.2	3.31	0.915 1094	156.0	9.42	1.07
	9	9	2	12.06	0.701	17	45	15.0	3.34	0.914 7424	149.8	9.43	1.07
	10	9	1	55.10	0.712	17	46	35.7	3.38	0.914 3904	143.5	9.43	1.07
	11	9	1	37.89	-0.722	+17	47	57.2	+3.41	0.914 0534	-137.3	9.44	1.07
	12	9	1	20.46	0.731	17	49	19.4	3.44	0.913 7318	130.8	9.45	1.07
	13	9	1	2.81	0.740	17	50	42.4	3.47	0.913 4256	124.3	9.45	1.07
	14	9	0	44.94	0.748	17	52	6.0	3.50	0.913 1351	117.8	9.46	1.07
	15	9	0	26.88	0.756	17	53	30.2	3.52	0.912 8604	111.1	9.47	1.08
	16	9	0	8.64	-0.764	+17	54	55.0	+3.54	0.912 6017	-104.4	9.47	1.08
	17	8	59	50.22	0.771	17	56	20.3	3.56	0.912 3591	97.7	9.48	1.08
	18	8	59	31.63	0.778	17	57	46.1	3.58	0.912 1326	91.0	9.48	1.08
	19	8	59	12.88	0.784	17	59	12.3	3.60	0.911 9224	84.2	9.49	1.08
	20	8	58	53.99	0.790	18	0	38.8	3.61	0.911 7286	77.3	9.49	1.08
	21	8	58	34.97	-0.795	+18	2	5.6	+3.62	0.911 5512	-70.5	9.50	1.08
	22	8	58	15.83	0.800	18	3	32.7	3.63	0.911 3903	63.6	9.50	1.08
	23	8	57	56.58	0.804	18	4	59.9	3.64	0.911 2460	56.7	9.50	1.08
	24	8	57	37.23	0.808	18	6	27.3	3.65	0.911 1183	49.7	9.50	1.08
	25	8	57	17.79	0.812	18	7	54.9	3.65	0.911 0073	42.8	9.51	1.08
	26	8	56	58.27	-0.815	+18	9	22.5	+3.65	0.910 9130	-35.8	9.51	1.08
	27	8	56	38.68	0.818	18	10	50.1	3.65	0.910 8355	28.8	9.51	1.08
	28	8	56	19.03	0.820	18	12	17.7	3.65	0.910 7749	21.8	9.51	1.08
	29	8	55	59.34	0.821	18	13	45.2	3.64	0.910 7311	14.7	9.51	1.08
	30	8	55	39.61	0.822	18	15	12.6	3.64	0.910 7041	7.7	9.51	1.08
31	8	55	19.86	-0.823	+18	16	39.8	+3.63	0.910 6941	-0.7	9.52	1.08	
Feb.	1	8	55	0.10	0.823	18	18	6.8	3.62	0.910 7009	+6.4	9.51	1.08
	2	8	54	40.34	0.823	18	19	33.6	3.61	0.910 7246	13.4	9.51	1.08
	3	8	54	20.58	0.823	18	21	0.0	3.59	0.910 7651	20.4	9.51	1.08
	4	8	54	0.85	0.821	18	22	26.1	3.58	0.910 8226	27.5	9.51	1.08
	5	8	53	41.15	-0.820	+18	23	51.8	+3.56	0.910 8970	+34.5	9.51	1.08
	6	8	53	21.49	0.818	18	25	17.1	3.54	0.910 9883	41.5	9.51	1.08
	7	8	53	1.88	0.815	18	26	41.8	3.52	0.911 0964	48.5	9.51	1.08
	8	8	52	42.35	0.812	18	28	6.1	3.50	0.911 2213	55.5	9.50	1.08
	9	8	52	22.89	0.809	18	29	29.7	3.47	0.911 3629	62.5	9.50	1.08
	10	8	52	3.53	-0.805	+18	30	52.7	+3.44	0.911 5212	+69.4	9.50	1.08
	11	8	51	44.27	0.800	18	32	15.0	3.41	0.911 6960	76.3	9.49	1.08
	12	8	51	25.12	0.795	18	33	36.6	3.38	0.911 8873	83.1	9.49	1.08
	13	8	51	6.09	0.790	18	34	57.3	3.35	0.912 0950	89.9	9.48	1.08
	14	8	50	47.21	0.784	18	36	17.3	3.31	0.912 3189	96.7	9.48	1.08
	15	8	50	28.47	-0.778	+18	37	36.4	+3.28	0.912 5590	+103.3	9.47	1.08
	16	8	50	9.89	-0.771	+18	38	54.6	+3.24	0.912 8149	+109.9	9.47	1.08

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.		
	Noon.				Noon.										
	h	m	s	s	"	"	"	"					h	m	
Feb.	16	8	50	9.89	-0.771	+18	38	54.6	+3.24	0.912 8149	+109.9	9.47	1.08	11	5.5
	17	8	49	51.48	0.763	18	40	11.9	3.20	0.913 0866	116.5	9.46	1.07	11	1.3
	18	8	49	33.26	0.755	18	41	28.2	3.16	0.913 3739	122.9	9.46	1.07	10	57.1
	19	8	49	15.22	0.747	18	42	43.5	3.12	0.913 6767	129.4	9.45	1.07	10	52.8
	20	8	48	57.39	0.739	18	43	57.8	3.07	0.913 9948	135.7	9.44	1.07	10	48.6
	21	8	48	39.77	-0.730	+18	45	11.0	+3.03	0.914 3280	+141.9	9.43	1.07	10	44.4
	22	8	48	22.37	0.720	18	46	23.1	2.98	0.914 6761	148.1	9.43	1.07	10	40.2
	23	8	48	5.19	0.711	18	47	34.1	2.93	0.915 0390	154.2	9.42	1.07	10	36.0
	24	8	47	48.26	0.700	18	48	43.9	2.88	0.915 4165	160.3	9.41	1.07	10	31.7
	25	8	47	31.57	0.690	18	49	52.5	2.83	0.915 8083	166.2	9.40	1.07	10	27.5
Mar.	26	8	47	15.14	-0.679	+18	50	59.9	+2.78	0.916 2143	+172.1	9.39	1.07	10	23.3
	27	8	46	58.97	0.668	18	52	6.1	2.73	0.916 6343	177.9	9.38	1.07	10	19.1
	28	8	46	43.07	0.657	18	53	11.0	2.68	0.917 0680	183.5	9.38	1.07	10	14.9
	1	8	46	27.45	0.645	18	54	14.5	2.62	0.917 5153	189.2	9.37	1.06	10	10.7
	2	8	46	12.12	0.633	18	55	16.7	2.56	0.917 9760	194.7	9.36	1.06	10	6.6
	3	8	45	57.09	-0.620	+18	56	17.6	+2.51	0.918 4498	+200.1	9.35	1.06	10	2.4
	4	8	45	42.36	0.607	18	57	17.1	2.45	0.918 9366	205.5	9.34	1.06	9	58.2
	5	8	45	27.94	0.594	18	58	15.3	2.40	0.919 4361	210.8	9.32	1.06	9	54.1
	6	8	45	13.84	0.581	18	59	12.1	2.34	0.919 9482	215.9	9.31	1.06	9	49.9
	7	8	45	0.07	0.567	19	0	7.4	2.27	0.920 4725	221.0	9.30	1.06	9	45.7
	8	8	44	46.64	-0.553	+19	1	1.2	+2.21	0.921 0090	+226.0	9.29	1.06	9	41.6
	9	8	44	33.55	0.538	19	1	53.5	2.15	0.921 5573	230.9	9.28	1.05	9	37.4
	10	8	44	20.81	0.523	19	2	44.3	2.08	0.922 1173	235.7	9.27	1.05	9	33.3
	11	8	44	8.43	0.508	19	3	33.5	2.02	0.922 6885	240.3	9.26	1.05	9	29.2
	12	8	43	56.41	0.493	19	4	21.2	1.96	0.923 2708	244.9	9.25	1.05	9	25.0
	13	8	43	44.76	-0.478	+19	5	7.4	+1.89	0.923 8639	+249.3	9.23	1.05	9	20.9
	14	8	43	33.49	0.462	19	5	52.0	1.82	0.924 4675	253.6	9.22	1.05	9	16.8
	15	8	43	22.60	0.446	19	6	34.9	1.76	0.925 0812	257.8	9.21	1.05	9	12.7
	16	8	43	12.10	0.429	19	7	16.3	1.69	0.925 7049	261.9	9.19	1.04	9	8.6
	17	8	43	1.99	0.413	19	7	56.0	1.62	0.926 3382	265.8	9.18	1.04	9	4.5
	18	8	42	52.28	-0.396	+19	8	34.0	+1.55	0.926 9809	+269.7	9.17	1.04	9	0.4
	19	8	42	42.97	0.379	19	9	10.4	1.48	0.927 6326	273.4	9.15	1.04	8	56.3
	20	8	42	34.07	0.362	19	9	45.2	1.41	0.928 2932	277.0	9.14	1.04	8	52.2
	21	8	42	25.58	0.345	19	10	18.3	1.34	0.928 9622	280.5	9.12	1.04	8	48.2
	22	8	42	17.50	0.328	19	10	49.7	1.28	0.929 6394	283.8	9.11	1.03	8	44.1
	23	8	42	9.84	-0.310	+19	11	19.5	+1.20	0.930 3246	+287.1	9.09	1.03	8	40.0
	24	8	42	2.60	0.293	19	11	47.5	1.13	0.931 0174	290.2	9.08	1.03	8	36.0
	25	8	41	55.78	0.275	19	12	13.9	1.06	0.931 7176	293.2	9.06	1.03	8	31.9
26	8	41	49.38	0.258	19	12	38.6	0.99	0.932 4249	296.1	9.05	1.03	8	27.9	
27	8	41	43.41	0.240	19	13	1.5	0.92	0.933 1391	299.0	9.04	1.03	8	23.9	
28	8	41	37.87	-0.222	+19	13	22.8	+0.85	0.933 8599	+301.6	9.02	1.02	8	19.9	
29	8	41	32.76	0.204	19	13	42.4	0.78	0.934 5869	304.2	9.01	1.02	8	15.9	
30	8	41	28.09	0.186	19	14	0.3	0.71	0.935 3200	306.7	8.99	1.02	8	11.8	
31	8	41	23.85	0.168	19	14	16.5	0.64	0.936 0589	309.0	8.97	1.02	8	7.8	
Apr.	1	8	41	20.04	0.149	19	14	31.0	0.57	0.936 8034	311.3	8.96	1.02	8	3.8
	2	8	41	16.68	-0.131	+19	14	43.7	+0.49	0.937 5531	+313.4	8.94	1.02	7	59.3
	3	8	41	13.76	-0.112	+19	14	54.7	+0.42	0.938 3079	+315.5	8.93	1.01	7	55.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"					h	m
Apr.	1	8	41	20.04	-0.149	+19	14	31.0	+0.57	0.936 8034	+311.3	8.96	1.02	8 3.8
	2	8	41	16.68	0.131	19	14	43.7	0.49	0.937 5531	313.4	8.94	1.02	7 59.9
	3	8	41	13.76	0.112	19	14	54.7	0.42	0.938 3079	315.5	8.93	1.01	7 55.9
	4	8	41	11.28	0.094	19	15	4.0	0.35	0.939 0675	317.4	8.91	1.01	7 51.9
	5	8	41	9.24	0.076	19	15	11.6	0.28	0.939 8316	319.3	8.90	1.01	7 48.0
	6	8	41	7.64	-0.057	+19	15	17.5	+0.21	0.940 6000	+321.0	8.88	1.01	7 44.0
	7	8	41	6.50	0.038	19	15	21.6	0.14	0.941 3724	322.6	8.87	1.01	7 40.1
	8	8	41	5.80	0.020	19	15	24.0	+0.06	0.942 1485	324.1	8.85	1.01	7 36.1
	9	8	41	5.55	-0.001	19	15	24.7	-0.01	0.942 9280	325.5	8.83	1.00	7 32.2
	10	8	41	5.74	+0.017	19	15	23.6	0.08	0.943 7107	326.7	8.82	1.00	7 28.3
	11	8	41	6.39	+0.036	+19	15	20.8	-0.15	0.944 4963	+327.9	8.80	1.00	7 24.3
	12	8	41	7.48	0.055	19	15	16.3	0.22	0.945 2846	328.9	8.79	1.00	7 20.4
	13	8	41	9.03	0.074	19	15	10.1	0.30	0.946 0752	329.8	8.77	1.00	7 16.5
	14	8	41	11.02	0.092	19	15	2.1	0.37	0.946 8679	330.7	8.75	0.99	7 12.6
	15	8	41	13.46	0.111	19	14	52.4	0.44	0.947 6624	331.4	8.74	0.99	7 8.7
	16	8	41	16.35	+0.130	+19	14	41.0	-0.51	0.948 4585	+332.0	8.72	0.99	7 4.8
	17	8	41	19.68	0.148	19	14	27.9	0.58	0.949 2559	332.5	8.71	0.99	7 1.0
	18	8	41	23.45	0.166	19	14	13.1	0.65	0.950 0544	332.9	8.69	0.99	6 57.1
	19	8	41	27.66	0.185	19	13	56.7	0.72	0.950 8537	333.1	8.67	0.99	6 53.2
	20	8	41	32.31	0.203	19	13	38.5	0.79	0.951 6535	333.3	8.66	0.98	6 49.4
	21	8	41	37.40	+0.221	+19	13	18.7	-0.86	0.952 4537	+333.4	8.64	0.98	6 45.6
	22	8	41	42.92	0.239	19	12	57.2	0.93	0.953 2539	333.4	8.63	0.98	6 41.7
	23	8	41	48.87	0.257	19	12	34.1	1.00	0.954 0541	333.3	8.61	0.98	6 37.9
	24	8	41	55.26	0.275	19	12	9.3	1.07	0.954 8539	333.2	8.59	0.98	6 34.1
	25	8	42	2.07	0.293	19	11	42.9	1.14	0.955 6533	332.9	8.58	0.97	6 30.2
	26	8	42	9.31	+0.310	+19	11	14.8	-1.20	0.956 4519	+332.6	8.56	0.97	6 26.4
	27	8	42	16.97	0.328	19	10	45.1	1.27	0.957 2497	332.2	8.55	0.97	6 22.6
	28	8	42	25.05	0.345	19	10	13.8	1.34	0.958 0463	331.7	8.53	0.97	6 18.8
	29	8	42	33.55	0.363	19	9	40.9	1.40	0.958 8417	331.1	8.52	0.97	6 15.0
	30	8	42	42.46	0.380	19	9	6.4	1.47	0.959 6355	330.4	8.50	0.97	6 11.3
May	1	8	42	51.79	+0.397	+19	8	30.3	-1.54	0.960 4276	+329.6	8.48	0.96	6 7.5
	2	8	43	1.53	0.414	19	7	52.6	1.60	0.961 2178	328.8	8.47	0.96	6 3.7
	3	8	43	11.67	0.431	19	7	13.3	1.67	0.962 0059	327.9	8.45	0.96	6 0.0
	4	8	43	22.22	0.448	19	6	32.4	1.74	0.962 7918	327.0	8.44	0.96	5 56.2
	5	8	43	33.18	0.465	19	5	50.0	1.80	0.963 5753	325.9	8.42	0.96	5 52.5
	6	8	43	44.53	+0.481	+19	5	5.9	-1.87	0.964 3561	+324.7	8.41	0.96	5 48.7
	7	8	43	56.28	0.498	19	4	20.3	1.93	0.965 1340	323.5	8.39	0.95	5 45.0
	8	8	44	8.43	0.514	19	3	33.1	2.00	0.965 9089	322.2	8.38	0.95	5 41.2
	9	8	44	20.97	0.531	19	2	44.4	2.06	0.966 6806	320.8	8.36	0.95	5 37.5
	10	8	44	33.90	0.547	19	1	54.1	2.13	0.967 4488	319.3	8.35	0.95	5 33.8
	11	8	44	47.22	+0.563	+19	1	2.3	-2.19	0.968 2134	+317.8	8.33	0.95	5 30.1
	12	8	45	0.91	0.579	19	0	9.0	2.25	0.968 9742	316.1	8.32	0.95	5 26.4
	13	8	45	14.99	0.594	18	59	14.2	2.31	0.969 7309	314.4	8.30	0.94	5 22.7
	14	8	45	29.44	0.610	18	58	17.9	2.38	0.970 4835	312.7	8.29	0.94	5 19.0
	15	8	45	44.26	0.625	18	57	20.1	2.44	0.971 2317	310.8	8.28	0.94	5 15.3
	16	8	45	59.44	+0.640	+18	56	20.9	-2.50	0.971 9754	+308.9	8.26	0.94	5 11.6
	17	8	46	14.09	+0.655	+18	55	20.2	-2.56	0.972 7144	+306.9	8.25	0.94	5 8.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.			
	Noon.				Noon.											
	h	m	s	s	"	"	"	"			"	"	h	m	s	
May	17	8	46	14.99	+0.655	+18	55	20.2	-2.56	0.972 7144	+306.9	8.25	0.94	5	8	0
	18	8	46	30.89	0.670	18	54	18.0	2.62	0.973 4486	304.9	8.23	0.94	5	4	3
	19	8	46	47.14	0.684	18	53	14.4	2.68	0.974 1779	302.8	8.22	0.93	5	0	6
	20	8	47	3.74	0.699	18	52	9.4	2.74	0.974 9020	300.6	8.21	0.93	4	57	0
	21	8	47	20.69	0.713	18	51	3.0	2.80	0.975 6209	298.4	8.19	0.93	4	53	3
	22	8	47	37.97	+0.727	+18	49	55.1	-2.86	0.976 3345	+296.2	8.18	0.93	4	49	7
	23	8	47	55.59	0.741	18	48	45.9	2.91	0.977 0426	293.9	8.17	0.93	4	46	1
	24	8	48	13.53	0.755	18	47	35.3	2.97	0.977 7451	291.5	8.15	0.93	4	42	4
	25	8	48	31.81	0.768	18	46	23.3	3.03	0.978 4418	289.1	8.14	0.92	4	38	8
	26	8	48	50.41	0.781	18	45	10.0	3.08	0.979 1327	286.6	8.13	0.92	4	35	2
	27	8	49	9.32	+0.795	+18	43	55.4	-3.14	0.979 8176	+284.1	8.11	0.92	4	31	5
	28	8	49	28.55	0.808	18	42	39.4	3.19	0.980 4964	281.6	8.10	0.92	4	27	9
June	29	8	49	48.09	0.820	18	41	22.1	3.25	0.981 1691	279.0	8.09	0.92	4	24	3
	30	8	50	7.93	0.833	18	40	3.5	3.30	0.981 8354	276.3	8.08	0.92	4	20	7
	31	8	50	28.08	0.846	18	38	43.6	3.36	0.982 4954	273.6	8.07	0.92	4	17	1
	1	8	50	48.53	+0.858	+18	37	22.3	-3.41	0.983 1488	+270.9	8.05	0.91	4	13	5
	2	8	51	9.28	0.871	18	35	59.7	3.47	0.983 7956	268.1	8.04	0.91	4	10	0
	3	8	51	30.32	0.882	18	34	35.9	3.52	0.984 4357	265.3	8.03	0.91	4	6	4
	4	8	51	51.64	0.894	18	33	10.8	3.57	0.985 0689	262.4	8.02	0.91	4	2	8
	5	8	52	13.25	0.906	18	31	44.4	3.63	0.985 6950	259.4	8.01	0.91	3	59	2
	6	8	52	35.14	+0.918	+18	30	16.8	-3.68	0.986 3140	+256.4	7.99	0.91	3	55	7
	7	8	52	57.31	0.929	18	28	47.9	3.73	0.986 9257	253.4	7.98	0.91	3	52	1
	8	8	53	19.74	0.940	18	27	17.9	3.78	0.987 5301	250.3	7.97	0.91	3	48	5
	9	8	53	42.44	0.951	18	25	46.6	3.83	0.988 1270	247.1	7.96	0.90	3	45	0
July	10	8	54	5.41	0.962	18	24	14.1	3.88	0.988 7163	244.0	7.95	0.90	3	41	4
	11	8	54	28.63	+0.973	+18	22	40.4	-3.93	0.989 2980	+240.8	7.94	0.90	3	37	9
	12	8	54	52.10	0.983	18	21	5.6	3.98	0.989 8719	237.5	7.93	0.90	3	34	3
	13	8	55	15.82	0.993	18	19	29.6	4.02	0.990 4379	234.2	7.92	0.90	3	30	8
	14	8	55	39.78	1.003	18	17	52.5	4.07	0.990 9900	230.9	7.91	0.90	3	27	3
	15	8	56	3.98	1.013	18	16	14.2	4.12	0.991 5460	227.5	7.90	0.90	3	23	7
	16	8	56	28.41	+1.023	+18	14	34.9	-4.16	0.992 0879	+224.1	7.89	0.90	3	20	2
	17	8	56	53.07	1.032	18	12	54.4	4.21	0.992 6216	220.7	7.88	0.90	3	16	7
	18	8	57	17.95	1.041	18	11	12.9	4.25	0.993 1471	217.2	7.87	0.89	3	13	2
	19	8	57	43.05	1.050	18	9	30.3	4.30	0.993 6642	213.7	7.86	0.89	3	9	7
	20	8	58	8.36	1.059	18	7	46.7	4.34	0.994 1729	210.2	7.85	0.89	3	6	1
	21	8	58	33.88	+1.068	+18	6	2.0	-4.38	0.994 6732	+206.7	7.84	0.89	3	2	6
August	22	8	58	59.61	1.076	18	4	16.3	4.42	0.995 1650	203.1	7.83	0.89	2	59	1
	23	8	59	25.54	1.085	18	2	29.6	4.47	0.995 6483	199.6	7.82	0.89	2	55	6
	24	8	59	51.67	1.093	18	0	41.8	4.51	0.996 1229	196.0	7.82	0.89	2	52	1
	25	9	0	17.98	1.100	17	58	53.1	4.55	0.996 5889	192.4	7.81	0.89	2	48	6
	26	9	0	44.48	+1.108	+17	57	3.4	-4.59	0.997 0462	+188.7	7.80	0.89	2	45	1
	27	9	1	11.17	1.116	17	55	12.7	4.63	0.997 4947	185.0	7.79	0.89	2	41	7
	28	9	1	38.04	1.123	17	53	21.1	4.67	0.997 9343	181.3	7.78	0.88	2	38	2
	29	9	2	5.09	1.131	17	51	28.6	4.71	0.998 3650	177.6	7.78	0.88	2	34	7
	30	9	2	32.31	1.138	17	49	35.1	4.75	0.998 7868	173.9	7.77	0.88	2	31	2
	1	9	2	59.70	+1.145	+17	47	40.7	-4.79	0.999 1996	+170.1	7.76	0.88	2	27	7
	2	9	3	27.26	+1.151	+17	45	45.3	-4.82	0.999 6033	+166.3	7.75	0.88	2	24	3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.		
	Noon.				Noon.									Noon.	Noon.
	h	m	s	s	°	'	"	"			"	"	h	m	
July	1	9	2	59.70	+1.145	+17	47	40.7	-4.79	0.999 1996	+170.1	7.76	0.88	2	27.7
	2	9	3	27.26	1.151	17	45	45.3	4.82	0.999 6033	166.3	7.75	0.88	2	24.3
	3	9	3	54.97	1.158	17	43	49.1	4.86	0.999 9978	162.5	7.75	0.88	2	20.8
	4	9	4	22.84	1.165	17	41	52.0	4.90	1.000 3832	158.6	7.74	0.88	2	17.3
	5	9	4	50.87	1.171	17	39	54.0	4.93	1.000 7593	154.7	7.73	0.88	2	13.8
	6	9	5	19.04	+1.177	+17	37	55.2	-4.97	1.001 1260	+150.8	7.73	0.88	2	10.4
	7	9	5	47.35	1.182	17	35	55.6	5.00	1.001 4832	146.9	7.72	0.88	2	6.9
	8	9	6	15.80	1.188	17	33	55.2	5.04	1.001 8309	142.9	7.71	0.88	2	3.5
	9	9	6	44.39	1.194	17	31	53.9	5.07	1.002 1690	138.9	7.71	0.88	2	0.0
	10	9	7	13.11	1.199	17	29	51.9	5.10	1.002 4976	134.9	7.70	0.87	1	56.5
	11	9	7	41.95	+1.204	+17	27	49.1	-5.13	1.002 8166	+130.9	7.70	0.87	1	53.1
	12	9	8	10.91	1.209	17	25	45.6	5.16	1.003 1259	126.9	7.69	0.87	1	49.6
	13	9	8	39.99	1.214	17	23	41.4	5.19	1.003 4256	122.8	7.68	0.87	1	46.2
	14	9	9	9.17	1.218	17	21	36.4	5.22	1.003 7155	118.8	7.68	0.87	1	42.7
	15	9	9	38.46	1.223	17	19	30.8	5.25	1.003 9957	114.7	7.68	0.87	1	39.3
	16	9	10	7.86	+1.227	+17	17	24.5	-5.28	1.004 2660	+110.7	7.67	0.87	1	35.9
	17	9	10	37.35	1.231	17	15	17.6	5.30	1.004 5266	106.5	7.67	0.87	1	32.4
	18	9	11	6.93	1.234	17	13	10.0	5.33	1.004 7773	102.4	7.66	0.87	1	29.0
	19	9	11	36.60	1.238	17	11	1.8	5.35	1.005 0181	98.3	7.66	0.87	1	25.5
	20	9	12	6.36	1.242	17	8	53.0	5.38	1.005 2491	94.2	7.65	0.87	1	22.1
	21	9	12	36.20	+1.245	+17	6	43.6	-5.40	1.005 4702	+90.1	7.65	0.87	1	18.6
	22	9	13	6.12	1.248	17	4	33.6	5.43	1.005 6815	86.0	7.65	0.87	1	15.2
	23	9	13	36.10	1.251	17	2	23.0	5.45	1.005 8828	81.8	7.64	0.87	1	11.8
	24	9	14	6.15	1.253	17	0	11.9	5.47	1.006 0743	77.7	7.64	0.87	1	8.3
	25	9	14	36.26	1.256	16	58	0.3	5.49	1.006 2558	73.5	7.64	0.87	1	4.9
	26	9	15	6.43	+1.258	+16	55	48.2	-5.51	1.006 4273	+69.4	7.63	0.87	1	1.5
	27	9	15	36.66	1.261	16	53	35.6	5.54	1.006 5888	65.2	7.63	0.87	0	58.1
	28	9	16	6.95	1.263	16	51	22.5	5.55	1.006 7403	61.0	7.63	0.87	0	54.6
	29	9	16	37.29	1.265	16	49	9.0	5.57	1.006 8817	56.8	7.62	0.87	0	51.2
	30	9	17	7.67	1.267	16	46	55.0	5.59	1.007 0130	52.6	7.62	0.87	0	47.8
31	9	17	38.09	+1.269	+16	44	40.6	-5.61	1.007 1342	+48.4	7.62	0.87	0	44.3	
Aug.	1	9	18	8.56	1.270	16	42	25.8	5.63	1.007 2453	44.2	7.62	0.87	0	40.9
	2	9	18	39.05	1.271	16	40	10.5	5.64	1.007 3462	39.9	7.62	0.87	0	37.5
	3	9	19	9.58	1.272	16	37	54.9	5.66	1.007 4368	35.6	7.61	0.87	0	34.1
	4	9	19	40.13	1.273	16	35	38.9	5.67	1.007 5173	31.4	7.61	0.86	0	30.6
	5	9	20	10.70	+1.274	+16	33	22.6	-5.69	1.007 5875	+27.1	7.61	0.86	0	27.2
	6	9	20	41.29	1.275	16	31	6.0	5.70	1.007 6473	22.8	7.61	0.86	0	23.8
	7	9	21	11.89	1.275	16	28	49.1	5.71	1.007 6969	18.5	7.61	0.86	0	20.4
	8	9	21	42.50	1.275	16	26	32.0	5.72	1.007 7361	14.2	7.61	0.86	0	16.9
	9	9	22	13.11	1.275	16	24	14.6	5.73	1.007 7650	9.9	7.61	0.86	0	13.5
	10	9	22	43.72	+1.275	+16	21	57.1	-5.74	1.007 7836	+5.6	7.61	0.86	0	10.1
	11	9	23	14.32	1.275	16	19	39.3	5.75	1.007 7919	+1.3	7.61	0.86	0	6.7
	12	9	23	44.90	1.274	16	17	21.3	5.75	1.007 7898	-3.0	7.61	0.86	0	3.2
	13	9	24	15.47	1.274	16	15	3.1	5.76	1.007 7774	7.3	7.61	0.86	23	56.4
	14	9	24	46.03	1.273	16	12	44.8	5.76	1.007 7548	11.6	7.61	0.86	23	53.0
	15	9	25	16.56	+1.271	+16	10	26.4	-5.77	1.007 7219	-15.9	7.61	0.86	23	49.5
	16	9	25	47.06	+1.270	+16	8	8.0	-5.77	1.007 6787	-20.1	7.61	0.86	23	46.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	"							h	m
Aug. 16	9	25	47.06	+1.370	+16	8	8.0	-5.77	1.007 6787	-20.1	7.61	0.86	23 46.1
17	9	26	17.53	1.269	16	5	49.5	5.77	1.007 6254	24.4	7.61	0.86	23 42.7
18	9	26	47.96	1.267	16	3	30.9	5.77	1.007 5618	28.6	7.61	0.86	23 39.2
19	9	27	18.35	1.265	16	1	12.3	5.77	1.007 4880	32.9	7.61	0.86	23 35.8
20	9	27	48.70	1.263	15	58	53.7	5.77	1.007 4040	37.1	7.61	0.87	23 32.4
21	9	28	19.00	+1.261	+15	56	35.1	-5.77	1.007 3098	-41.4	7.62	0.87	23 28.9
22	9	28	49.25	1.259	15	54	16.5	5.77	1.007 2053	45.6	7.62	0.87	23 25.5
23	9	29	19.45	1.257	15	51	58.0	5.77	1.007 0907	49.9	7.62	0.87	23 22.1
24	9	29	49.59	1.254	15	49	39.5	5.77	1.006 9659	54.1	7.62	0.87	23 18.7
25	9	30	19.66	1.252	15	47	21.1	5.76	1.006 8310	58.3	7.62	0.87	23 15.2
26	9	30	49.67	+1.249	+15	45	2.8	-5.76	1.006 6859	-62.6	7.63	0.87	23 11.8
27	9	31	19.61	1.246	15	42	44.6	5.75	1.006 5306	66.8	7.63	0.87	23 8.4
28	9	31	49.48	1.243	15	40	26.6	5.75	1.006 3652	71.1	7.63	0.87	23 4.9
29	9	32	19.27	1.240	15	38	8.7	5.74	1.006 1895	75.3	7.64	0.87	23 1.5
30	9	32	48.98	1.236	15	35	51.0	5.73	1.006 0037	79.5	7.64	0.87	22 58.0
31	9	33	18.61	+1.232	+15	33	33.6	-5.72	1.005 8077	-83.8	7.64	0.87	22 54.6
Sept. 1	9	33	48.14	1.229	15	31	16.5	5.71	1.005 6015	88.0	7.65	0.87	22 51.1
2	9	34	17.58	1.224	15	28	59.6	5.70	1.005 3852	92.2	7.65	0.87	22 47.7
3	9	34	46.91	1.220	15	26	43.0	5.68	1.005 1588	96.5	7.65	0.87	22 44.2
4	9	35	16.14	1.216	15	24	26.8	5.67	1.004 9222	100.7	7.66	0.87	22 40.8
5	9	35	45.26	+1.211	+15	22	10.9	-5.65	1.004 6756	-104.9	7.66	0.87	22 37.4
6	9	36	14.27	1.206	15	19	55.4	5.64	1.004 4188	109.1	7.67	0.87	22 33.9
7	9	36	43.16	1.201	15	17	40.3	5.62	1.004 1520	113.2	7.67	0.87	22 30.4
8	9	37	11.94	1.196	15	15	25.6	5.60	1.003 8753	117.4	7.68	0.87	22 27.0
9	9	37	40.58	1.191	15	13	11.4	5.58	1.003 5886	121.5	7.68	0.87	22 23.5
10	9	38	9.09	+1.185	+15	10	57.7	-5.56	1.003 2921	-125.6	7.69	0.87	22 20.1
11	9	38	37.47	1.179	15	8	44.5	5.54	1.002 9857	129.7	7.69	0.87	22 16.6
12	9	39	5.70	1.173	15	6	31.8	5.52	1.002 6695	133.8	7.70	0.87	22 13.1
13	9	39	33.79	1.167	15	4	19.7	5.49	1.002 3436	137.8	7.70	0.88	22 9.7
14	9	40	1.73	1.161	15	2	8.2	5.47	1.002 0079	141.9	7.71	0.88	22 6.2
15	9	40	29.52	+1.155	+14	59	57.3	-5.44	1.001 6625	-145.9	7.72	0.88	22 2.7
16	9	40	57.15	1.148	14	57	47.0	5.41	1.001 3076	149.9	7.72	0.88	21 59.2
17	9	41	24.62	1.141	14	55	37.4	5.39	1.000 9431	153.8	7.73	0.88	21 55.8
18	9	41	51.93	1.134	14	53	28.4	5.36	1.000 5692	157.8	7.74	0.88	21 52.3
19	9	42	19.07	1.127	14	51	20.1	5.33	1.000 1858	161.7	7.74	0.88	21 48.8
20	9	42	46.04	+1.120	+14	49	12.6	-5.30	0.999 7930	-165.6	7.75	0.88	21 45.3
21	9	43	12.84	1.113	14	47	5.9	5.26	0.999 3909	169.5	7.76	0.88	21 41.8
22	9	43	39.46	1.106	14	44	59.9	5.23	0.998 9795	173.3	7.76	0.88	21 38.4
23	9	44	5.90	1.098	14	42	54.7	5.20	0.998 5589	177.2	7.77	0.88	21 34.9
24	9	44	32.15	1.090	14	40	50.4	5.16	0.998 1291	181.0	7.78	0.88	21 31.4
25	9	44	58.21	+1.082	+14	38	46.9	-5.13	0.997 6900	-184.9	7.79	0.88	21 27.9
26	9	45	24.08	1.074	14	36	44.3	5.09	0.997 2417	188.7	7.80	0.89	21 24.3
27	9	45	49.74	1.065	14	34	42.5	5.05	0.996 7844	192.4	7.80	0.89	21 20.8
28	9	46	15.20	1.056	14	32	41.7	5.01	0.996 3180	196.2	7.81	0.89	21 17.3
29	9	46	40.45	1.048	14	30	41.9	4.97	0.995 8426	199.9	7.82	0.89	21 13.8
30	9	47	5.49	+1.039	+14	28	43.1	-4.93	0.995 3583	-203.6	7.83	0.89	21 10.3
Sept. 1	9	47	30.31	+1.030	+14	26	45.3	-4.89	0.994 8652	-207.3	7.84	0.89	21 6.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	"							h	m
Oct.	1	9 47	30.31	+1.030	+14 26	45.3	-4.89	0.994 8652	-207.3	7.84	0.89	21 6.8	
	2	9 47	54.91	1.020	14 24	48.5	4.84	0.994 3633	210.9	7.85	0.89	21 3.2	
	3	9 48	19.28	1.011	14 22	52.9	4.79	0.993 8527	214.5	7.86	0.89	20 59.7	
	4	9 48	43.42	1.001	14 20	58.4	4.75	0.993 3335	218.1	7.87	0.89	20 56.2	
	5	9 49	7.32	0.991	14 19	4.9	4.70	0.992 8057	221.7	7.88	0.89	20 52.6	
	6	9 49	30.99	+0.981	+14 17	12.7	-4.65	0.992 2695	-225.2	7.89	0.90	20 49.1	
	7	9 49	54.40	0.970	14 15	21.7	4.60	0.991 7249	228.6	7.89	0.90	20 45.5	
	8	9 50	17.57	0.960	14 13	31.9	4.55	0.991 1720	232.1	7.90	0.90	20 42.0	
	9	9 50	40.49	0.950	14 11	43.4	4.50	0.990 6110	235.4	7.91	0.90	20 38.4	
	10	9 51	3.15	0.939	14 9	56.1	4.44	0.990 0420	238.7	7.93	0.90	20 34.9	
	11	9 51	25.54	+0.928	+14 8	10.2	-4.39	0.989 4650	-242.0	7.94	0.90	20 31.3	
	12	9 51	47.67	0.916	14 6	25.6	4.33	0.988 8802	245.3	7.95	0.90	20 27.7	
	13	9 52	9.52	0.905	14 4	42.3	4.27	0.988 2877	248.5	7.96	0.90	20 24.2	
	14	9 52	31.10	0.893	14 3	0.4	4.21	0.987 6876	251.6	7.97	0.91	20 20.6	
	15	9 52	52.40	0.882	14 1	20.0	4.15	0.987 0800	254.7	7.98	0.91	20 17.0	
	16	9 53	13.42	+0.870	+13 59	41.0	-4.10	0.986 4651	-257.8	7.99	0.91	20 13.4	
	17	9 53	34.16	0.858	13 58	3.4	4.04	0.985 8428	260.8	8.00	0.91	20 9.8	
	18	9 53	54.60	0.846	13 56	27.3	3.97	0.985 2134	263.7	8.01	0.91	20 6.2	
	19	9 54	14.76	0.834	13 54	52.7	3.91	0.984 5770	266.6	8.03	0.91	20 2.6	
	20	9 54	34.62	0.821	13 53	19.6	3.85	0.983 9337	269.5	8.04	0.91	19 59.0	
	21	9 54	54.17	+0.808	+13 51	48.1	-3.79	0.983 2835	-272.3	8.05	0.91	19 55.4	
	22	9 55	13.42	0.796	13 50	18.1	3.72	0.982 6267	275.1	8.06	0.92	19 51.8	
	23	9 55	32.37	0.783	13 48	49.8	3.65	0.981 9632	277.8	8.07	0.92	19 48.2	
	24	9 55	51.01	0.770	13 47	23.1	3.58	0.981 2932	280.5	8.09	0.92	19 44.5	
	25	9 56	9.33	0.757	13 45	58.0	3.51	0.980 6167	283.2	8.10	0.92	19 40.9	
	26	9 56	27.33	+0.743	+13 44	34.7	-3.44	0.979 9340	-285.8	8.11	0.92	19 37.3	
	27	9 56	45.00	0.730	13 43	13.0	3.36	0.979 2451	288.3	8.13	0.92	19 33.6	
	28	9 57	2.35	0.716	13 41	53.2	3.29	0.978 5502	290.8	8.14	0.93	19 30.0	
	29	9 57	19.36	0.702	13 40	35.1	3.22	0.977 8495	293.2	8.15	0.93	19 26.3	
	30	9 57	36.04	0.688	13 39	18.8	3.14	0.977 1430	295.5	8.16	0.93	19 22.7	
Nov.	31	9 57	52.37	+0.673	+13 38	4.3	-3.06	0.976 4310	-297.8	8.18	0.93	19 19.0	
	1	9 58	8.36	0.659	13 36	51.7	2.99	0.975 7136	300.0	8.19	0.93	19 15.3	
	2	9 58	23.99	0.644	13 35	40.9	2.91	0.974 9910	302.1	8.21	0.93	19 11.6	
	3	9 58	39.27	0.629	13 34	32.0	2.83	0.974 2634	304.2	8.22	0.93	19 7.9	
	4	9 58	54.19	0.614	13 33	25.1	2.75	0.973 5309	306.2	8.23	0.94	19 4.3	
	5	9 59	8.75	+0.599	+13 32	20.1	-2.67	0.972 7937	-308.1	8.25	0.94	19 0.6	
	6	9 59	22.95	0.584	13 31	17.1	2.58	0.972 0521	309.9	8.26	0.94	18 56.9	
	7	9 59	36.77	0.568	13 30	16.1	2.50	0.971 3061	311.7	8.27	0.94	18 53.2	
	8	9 59	50.23	0.553	13 29	17.1	2.42	0.970 5560	313.4	8.29	0.94	18 49.5	
	9	10 0	3.31	0.537	13 28	20.1	2.33	0.969 8019	315.0	8.30	0.94	18 45.8	
	10	10 0	16.01	+0.521	+13 27	25.2	-2.25	0.969 0440	-316.5	8.32	0.95	18 42.0	
	11	10 0	28.33	0.505	13 26	32.3	2.16	0.968 2826	317.9	8.33	0.95	18 38.3	
	12	10 0	40.27	0.489	13 25	41.4	2.08	0.967 5179	319.3	8.35	0.95	18 34.6	
	13	10 0	51.82	0.473	13 24	52.7	1.99	0.966 7501	320.5	8.36	0.95	18 30.8	
	14	10 1	2.99	0.457	13 24	6.1	1.90	0.965 9793	321.7	8.38	0.95	18 27.1	
	15	10 1	13.76	+0.441	+13 23	21.7	-1.81	0.965 2057	-322.9	8.39	0.95	18 23.3	
	16	10 1	24.14	+0.424	+13 22	39.4	-1.72	0.964 4296	-323.9	8.41	0.96	18 19.5	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	"	"					h m
Jy. 16	10	1	24.14	+0.424	+13 22 39.4	-1.72	0.964 4296	-323.9	8.41	0.96	18 19.5
17	10	1	34.12	0.408	13 21 59.2	1.63	0.963 6511	324.8	8.42	0.96	18 15.8
18	10	1	43.71	0.391	13 21 21.2	1.54	0.962 8704	325.7	8.44	0.96	18 12.0
19	10	1	52.89	0.374	13 20 45.4	1.45	0.962 0877	326.5	8.45	0.96	18 8.2
20	10	2	1.66	0.357	13 20 11.8	1.35	0.961 3033	327.2	8.47	0.96	18 4.4
21	10	2	10.03	+0.340	+13 19 40.4	-1.26	0.960 5173	-327.8	8.48	0.96	18 0.6
22	10	2	18.00	0.323	13 19 11.3	1.17	0.959 7299	328.3	8.50	0.97	17 56.8
23	10	2	25.55	0.306	13 18 44.4	1.07	0.958 9413	328.7	8.51	0.97	17 53.0
24	10	2	32.69	0.289	13 18 19.8	0.98	0.958 1519	329.1	8.53	0.97	17 49.2
25	10	2	39.41	0.271	13 17 57.4	0.88	0.957 3617	329.4	8.55	0.97	17 45.3
26	10	2	45.72	+0.254	+13 17 37.4	-0.79	0.956 5710	-329.5	8.56	0.97	17 41.5
27	10	2	51.60	0.236	13 17 19.6	0.69	0.955 7800	329.6	8.58	0.97	17 37.7
28	10	2	57.05	0.219	13 17 4.2	0.59	0.954 9891	329.5	8.59	0.98	17 33.8
29	10	3	2.09	0.201	13 16 51.1	0.50	0.954 1984	329.3	8.61	0.98	17 30.0
30	10	3	6.69	0.183	13 16 40.4	0.40	0.953 4083	329.0	8.62	0.98	17 26.1
Dec. 1	10	3	10.87	+0.165	+13 16 32.0	-0.30	0.952 6190	-328.7	8.64	0.98	17 22.2
2	10	3	14.61	0.147	13 16 25.9	0.20	0.951 8307	328.2	8.65	0.98	17 18.4
3	10	3	17.92	0.129	13 16 22.2	0.10	0.951 0437	327.6	8.67	0.98	17 14.5
4	10	3	20.80	0.111	13 16 20.9	-0.01	0.950 2583	326.9	8.69	0.99	17 10.6
5	10	3	23.25	0.093	13 16 21.8	+0.09	0.949 4748	326.0	8.70	0.99	17 6.7
6	10	3	25.26	+0.075	+13 16 25.2	+0.19	0.948 6935	-325.0	8.72	0.99	17 2.8
7	10	3	26.84	0.057	13 16 30.9	0.29	0.947 9146	324.0	8.73	0.99	16 58.9
8	10	3	27.98	0.039	13 16 38.9	0.38	0.947 1385	322.8	8.75	0.99	16 55.0
9	10	3	28.70	0.021	13 16 49.3	0.48	0.946 3653	321.5	8.76	1.00	16 51.0
10	10	3	28.97	+0.002	13 17 2.1	0.58	0.945 5953	320.1	8.78	1.00	16 47.1
11	10	3	28.81	-0.015	+13 17 17.2	+0.68	0.944 8289	-318.5	8.79	1.00	16 43.1
12	10	3	28.23	0.033	13 17 34.6	0.77	0.944 0663	316.9	8.81	1.00	16 39.2
13	10	3	27.21	0.051	13 17 54.3	0.87	0.943 3077	315.2	8.83	1.00	16 35.3
14	10	3	25.77	0.069	13 18 16.3	0.96	0.942 5535	313.3	8.84	1.00	16 31.3
15	10	3	23.90	0.087	13 18 40.6	1.06	0.941 8040	311.3	8.86	1.01	16 27.4
16	10	3	21.60	-0.105	+13 19 7.2	+1.16	0.941 0593	-309.2	8.87	1.01	16 23.4
17	10	3	18.87	0.122	13 19 36.1	1.25	0.940 3198	307.0	8.89	1.01	16 19.4
18	10	3	15.72	0.140	13 20 7.2	1.34	0.939 5856	304.7	8.90	1.01	16 15.4
19	10	3	12.14	0.158	13 20 40.6	1.44	0.938 8570	302.3	8.92	1.01	16 11.4
20	10	3	8.15	0.175	13 21 16.3	1.53	0.938 1344	299.8	8.93	1.01	16 7.4
21	10	3	3.73	-0.193	+13 21 54.1	+1.62	0.937 4179	-297.2	8.95	1.02	16 3.4
22	10	2	58.89	0.210	13 22 34.2	1.72	0.936 7079	294.4	8.96	1.02	15 59.4
23	10	2	53.64	0.227	13 23 16.5	1.81	0.936 0046	291.6	8.97	1.02	15 55.3
24	10	2	47.97	0.245	13 24 1.0	1.90	0.935 3084	288.6	8.99	1.02	15 51.3
25	10	2	41.88	0.262	13 24 47.6	1.99	0.934 6195	285.5	9.00	1.02	15 47.3
26	10	2	35.39	-0.279	+13 25 36.4	+2.08	0.933 9382	-282.2	9.02	1.02	15 43.2
27	10	2	28.49	0.296	13 26 27.4	2.17	0.933 2648	278.9	9.03	1.03	15 39.2
28	10	2	21.18	0.313	13 27 20.4	2.25	0.932 5997	275.4	9.05	1.03	15 35.1
29	10	2	13.47	0.330	13 28 15.5	2.34	0.931 9431	271.8	9.06	1.03	15 31.1
30	10	2	5.36	0.346	13 29 12.6	2.42	0.931 2953	268.0	9.07	1.03	15 27.0
31	10	1	56.86	-0.362	+13 30 11.8	+2.51	0.930 6566	-264.2	9.09	1.03	15 22.9
32	10	1	47.96	....	+13 31 13.0	....	0.930 0273	....	9.10	1.03	15 18.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" " "	" "	" "	" " "	"		
Jan.	4	130 5 43.1	2 11.80	+0 55.0	+0 43 58.7	+5.47	0.960 0501	+ 93.7
	12	130 23 17.3	2 11.76	0 55.8	0 44 42.4	5.46	0.960 1253	94.2
	20	130 40 51.2	2 11.71	0 56.6	0 45 26.1	5.45	0.960 2009	94.8
	28	130 58 24.7	2 11.67	0 57.4	0 46 9.6	5.44	0.960 2771	95.4
Feb.	5	131 15 57.9	2 11.62	0 58.2	0 46 53.1	5.43	0.960 3536	95.9
	13	131 33 30.7	2 11.57	+0 59.0	+0 47 36.5	+5.42	0.960 4306	+ 96.5
	21	131 51 3.1	2 11.53	0 59.8	0 48 19.8	5.41	0.960 5080	97.1
Mar.	1	132 8 35.2	2 11.48	1 0.6	0 49 3.0	5.39	0.960 5859	97.6
	9	132 26 6.9	2 11.44	1 1.4	0 49 46.1	5.38	0.960 6642	98.1
	17	132 43 38.3	2 11.40	1 2.1	0 50 29.1	5.37	0.960 7429	98.7
	25	133 1 9.3	2 11.35	+1 2.9	+0 51 12.0	+5.36	0.960 8221	+ 99.2
Apr.	2	133 18 39.9	2 11.31	1 3.7	0 51 54.8	5.35	0.960 9017	99.8
	10	133 36 10.2	2 11.26	1 4.4	0 52 37.6	5.34	0.960 9818	100.4
	18	133 53 40.0	2 11.21	1 5.2	0 53 20.2	5.32	0.961 0623	100.9
	26	134 11 9.6	2 11.17	1 5.9	0 54 2.7	5.31	0.961 1433	101.5
May	4	134 28 38.7	2 11.11	+1 6.6	+0 54 45.2	+5.30	0.961 2247	+102.0
	12	134 46 7.4	2 11.07	1 7.3	0 55 27.5	5.29	0.961 3065	102.5
	20	135 3 35.8	2 11.02	1 8.1	0 56 9.8	5.28	0.961 3887	103.0
	28	135 21 3.7	2 10.97	1 8.8	0 56 51.9	5.26	0.961 4713	103.6
June	5	135 38 31.3	2 10.92	1 9.5	0 57 33.9	5.24	0.961 5544	104.1
	13	135 55 58.5	2 10.88	+1 10.2	+0 58 15.8	+5.23	0.961 6379	+104.6
	21	136 13 25.3	2 10.83	1 10.8	0 58 57.6	5.22	0.961 7218	105.2
	29	136 30 51.7	2 10.78	1 11.5	0 59 39.3	5.21	0.961 8062	105.7
July	7	136 48 17.8	2 10.73	1 12.2	1 0 20.9	5.19	0.961 8909	106.2
	15	137 5 43.4	2 10.68	1 12.9	1 1 2.4	5.18	0.961 9761	106.6
	23	137 23 8.7	2 10.63	+1 13.5	+1 1 43.8	+5.17	0.962 0615	+107.1
	31	137 40 33.5	2 10.58	1 14.2	1 2 25.1	5.15	0.962 1474	107.6
Aug.	8	137 57 58.0	2 10.53	1 14.8	1 3 6.2	5.14	0.962 2337	108.1
	16	138 15 22.0	2 10.48	1 15.5	1 3 47.3	5.13	0.962 3203	108.6
	24	138 32 45.7	2 10.43	1 16.1	1 4 28.3	5.11	0.962 4074	109.1
Sept.	1	138 50 8.9	2 10.38	+1 16.7	+1 5 9.1	+5.09	0.962 4948	+109.5
	9	139 7 31.7	2 10.33	1 17.3	1 5 49.8	5.08	0.962 5826	110.0
	17	139 24 54.2	2 10.28	1 17.9	1 6 30.4	5.06	0.962 6708	110.4
	25	139 42 16.2	2 10.23	1 18.5	1 7 10.8	5.05	0.962 7593	110.9
Oct.	3	139 59 37.9	2 10.18	1 19.0	1 7 51.2	5.04	0.962 8482	111.4
	11	140 16 59.1	2 10.12	+1 19.6	+1 8 31.4	+5.02	0.962 9375	+111.9
	19	140 34 19.9	2 10.07	1 20.2	1 9 11.5	5.01	0.963 0272	112.3
	27	140 51 40.2	2 10.02	1 20.7	1 9 51.5	4.99	0.963 1172	112.7
Nov.	4	141 9 0.2	2 9.97	1 21.3	1 10 31.3	4.98	0.963 2075	113.2
	12	141 26 19.7	2 9.91	1 21.8	1 11 11.1	4.96	0.963 2983	113.7
	20	141 43 38.8	2 9.86	+1 22.4	+1 11 50.7	+4.94	0.963 3894	+114.1
	28	142 0 57.5	2 9.81	1 22.9	1 12 30.2	4.93	0.963 4809	114.6
Dec.	6	142 18 15.8	2 9.76	1 23.4	1 13 9.6	4.91	0.963 5727	114.9
	14	142 35 33.6	2 9.71	1 23.9	1 13 48.8	4.89	0.963 6648	115.4
	22	142 52 51.1	2 9.66	1 24.4	1 14 27.9	4.88	0.963 7573	115.9
	30	143 10 8.1	2 9.59	+1 24.9	+1 15 6.9	+4.87	0.963 8502	+116.3
	38	143 27 24.6	2 9.54	+1 25.4	+1 15 45.8	+4.85	0.963 9434	+116.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Day.	Apparent Declination.			Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	h	m	s		°	'	"							h	m
Jan.	2	21	36	11.52	+11.110	-15	1	32.3	+56.02	1.316 6720	+2352.8	1.62	0.42	2 50.5
	6	21	36	56.86	11.554	14	57	43.6	58.26	1.317 5746	2159.5	1.61	0.42	2 35.5
	10	21	37	43.89	11.955	14	53	46.5	60.30	1.318 3984	1967.1	1.61	0.42	2 20.6
	14	21	38	32.44	12.311	14	49	41.5	62.14	1.319 1392	1745.9	1.61	0.42	2 5.7
	18	21	39	22.32	12.621	14	45	29.7	63.74	1.319 7943	1529.1	1.61	0.42	1 50.8
	22	21	40	13.35	+12.884	-14	41	11.9	+65.11	1.320 3619	+1308.1	1.60	0.42	1 35.9
	26	21	41	5.33	13.101	14	36	49.1	66.28	1.320 8403	1063.2	1.60	0.42	1 21.0
	30	21	41	58.10	13.276	14	32	22.0	67.24	1.321 2281	855.5	1.60	0.42	1 6.2
Feb.	3	21	42	51.48	13.406	14	27	51.5	68.00	1.321 5243	624.5	1.60	0.42	0 51.3
	7	21	43	45.29	13.491	14	23	18.3	68.51	1.321 7274	391.0	1.60	0.42	0 36.5
	11	21	44	39.35	+13.530	-14	18	43.7	+68.78	1.321 8369	+156.3	1.60	0.42	0 21.7
	15	21	45	33.47	13.522	14	14	8.4	68.81	1.321 8523	-79.2	1.60	0.42	0 6.8
	19	21	46	27.45	13.461	14	9	33.5	68.60	1.321 7737	312.8	1.60	0.42	23 48.3
	23	21	47	21.10	13.359	14	4	59.9	68.15	1.321 6025	543.4	1.60	0.42	23 33.5
	27	21	48	14.26	13.215	14	0	28.6	67.49	1.321 3394	770.8	1.60	0.42	23 18.6
Mar.	3	21	49	6.76	+13.028	-13	56	0.3	+66.61	1.320 9863	-995.1	1.60	0.42	23 3.7
	7	21	49	58.43	12.808	13	51	36.0	65.50	1.320 5437	1216.6	1.60	0.42	22 48.8
	11	21	50	49.12	12.533	13	47	16.6	64.16	1.320 0135	1433.8	1.60	0.42	22 33.9
	15	21	51	38.63	12.218	13	43	3.0	62.58	1.319 3974	1645.8	1.61	0.42	22 19.0
	19	21	52	26.80	11.960	13	38	56.3	60.75	1.318 6980	1849.4	1.61	0.42	22 4.1
	23	21	53	13.46	+11.468	-13	34	57.3	+58.73	1.317 9191	-2043.9	1.61	0.42	21 49.2
	27	21	53	58.49	11.040	13	31	6.8	56.50	1.317 0639	2231.0	1.62	0.42	21 34.2
	31	21	54	41.73	10.576	13	27	25.5	54.12	1.316 1354	2409.6	1.62	0.42	21 19.2
pr.	4	21	55	23.06	10.084	13	23	54.1	51.54	1.315 1373	2580.0	1.62	0.43	21 4.1
	8	21	56	2.35	9.555	13	20	33.5	48.71	1.314 0727	2741.1	1.63	0.43	20 49.0
	12	21	56	39.45	+8.989	-13	17	24.6	+45.73	1.312 9460	-2890.2	1.63	0.43	20 33.9
	16	21	57	14.22	8.394	13	14	27.9	42.58	1.311 7622	3026.9	1.63	0.43	20 18.7
	20	21	57	46.57	7.775	13	11	44.2	39.26	1.310 5262	3151.0	1.64	0.43	20 3.5
	24	21	58	16.39	7.132	13	9	14.0	35.81	1.309 2432	3261.5	1.64	0.43	19 48.3
	28	21	58	43.60	6.470	13	6	57.8	32.28	1.307 9187	3359.5	1.65	0.43	19 33.0
ay	2	21	59	8.12	+5.788	-13	4	55.9	+28.63	1.306 5573	-3444.9	1.65	0.43	19 17.7
	6	21	59	29.87	5.085	13	3	9.0	24.81	1.305 1647	3516.3	1.66	0.43	19 2.3
	10	21	59	48.77	4.362	13	1	37.5	20.92	1.303 7463	3572.6	1.67	0.44	18 46.9
	14	22	0	4.75	3.625	13	0	21.8	16.94	1.302 3088	3611.8	1.67	0.44	18 31.4
	18	22	0	17.76	2.879	12	59	22.0	12.95	1.300 8590	3635.0	1.68	0.44	18 15.9
	22	22	0	27.78	+2.131	-12	58	38.2	+8.92	1.299 4030	-3641.5	1.68	0.44	18 0.3
	26	22	0	34.81	1.382	12	58	10.6	4.89	1.297 9479	3632.4	1.69	0.44	17 44.7
	30	22	0	38.84	+0.630	12	57	59.1	+0.86	1.296 4991	3608.5	1.69	0.44	17 29.0
une	3	22	0	39.85	-0.124	12	58	3.7	-3.16	1.295 0634	3567.4	1.70	0.45	17 13.3
	7	22	0	37.86	0.871	12	58	24.4	7.19	1.293 6475	3509.2	1.70	0.45	16 57.5
	11	22	0	32.89	-1.612	-12	59	1.1	-11.13	1.292 2584	-3433.1	1.71	0.45	16 41.7
	15	22	0	24.98	2.389	12	59	53.3	14.95	1.290 9034	3339.0	1.71	0.45	16 25.9
	19	22	0	14.21	3.044	13	1	0.6	18.63	1.289 5894	3228.8	1.72	0.45	16 9.9
	23	22	0	0.66	3.726	13	2	22.5	22.25	1.288 3225	3102.9	1.73	0.45	15 54.0
	27	21	59	44.43	4.386	13	3	58.4	25.68	1.287 1091	2961.9	1.73	0.45	15 38.0
uly	1	21	59	25.60	-5.022	-13	5	47.7	-28.96	1.285 9550	-2906.0	1.74	0.46	15 21.9
	5	21	59	4.29	-5.631	-13	7	49.9	-32.09	1.284 8664	-2633.9	1.74	0.46	15 5.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Day.	Apparent Declination.			Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.			
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.				
	h	m	s	s	°	'	"	"			"	"	h	m		
July	1	21	59	25.60	-5.022	-13	5	47.7	-28.96	1.285 9550	-2806.0	1.74	0.46	15	21.9	
	5	21	59	4.29	5.631	13	7	49.9	32.09	1.284 8664	2633.9	1.74	0.46	15	5.8	
	9	21	58	40.61	6.204	13	10	4.1	34.98	1.283 8499	2446.5	1.74	0.46	14	49.7	
	13	21	58	14.72	6.733	13	12	29.4	37.61	1.282 9111	2245.0	1.75	0.46	14	33.6	
	17	21	57	46.81	7.218	13	15	4.7	40.01	1.282 0556	2030.8	1.75	0.46	14	17.4	
	21	21	57	17.04	-7.655	-13	17	49.1	-42.14	1.281 2879	-1806.4	1.75	0.46	14	1.1	
	25	21	56	45.63	8.046	13	20	41.4	43.98	1.280 6121	1572.0	1.76	0.46	13	44.9	
	29	21	56	12.73	8.394	13	23	40.6	45.59	1.280 0315	1329.1	1.76	0.46	13	28.6	
	Aug.	2	21	55	38.55	8.686	13	26	45.7	46.88	1.279 5501	1076.3	1.76	0.46	13	12.3
		6	21	55	3.32	8.921	13	29	55.2	47.84	1.279 1716	815.2	1.76	0.46	12	56.0
	10	21	54	27.26	-9.098	-13	33	8.0	-48.52	1.278 8986	-549.1	1.76	0.46	12	39.7	
	14	21	53	50.62	9.211	13	36	22.7	48.80	1.278 7328	279.1	1.76	0.46	12	23.3	
	18	21	53	13.65	9.263	13	39	38.0	48.79	1.278 6754	- 8.8	1.76	0.46	12	7.0	
	22	21	52	36.60	9.255	13	42	52.6	48.46	1.278 7258	+ 261.5	1.76	0.46	11	50.6	
	26	21	51	59.69	9.191	13	46	5.3	47.85	1.278 8846	532.1	1.76	0.46	11	34.3	
	30	21	51	23.15	-9.066	-13	49	15.0	-46.91	1.279 1513	+ 801.1	1.76	0.46	11	18.0	
	Sept.	3	21	50	47.24	8.879	13	52	20.2	45.65	1.279 5251	1067.0	1.76	0.46	11	1.7
		7	21	50	12.20	8.630	13	55	19.8	44.09	1.280 0042	1327.5	1.76	0.46	10	45.4
	11	21	49	38.28	8.320	13	58	12.5	42.21	1.280 5861	1580.6	1.76	0.46	10	29.1	
	15	21	49	5.72	7.951	14	0	57.1	40.06	1.281 2674	1823.6	1.75	0.46	10	12.8	
	19	21	48	34.74	-7.534	-14	3	32.7	-37.68	1.282 0436	+2056.2	1.75	0.46	9	56.6	
	23	21	48	5.52	7.065	14	5	58.2	35.05	1.282 9110	2278.8	1.75	0.46	9	40.4	
	27	21	47	38.28	6.550	14	8	12.8	32.21	1.283 8650	2489.4	1.74	0.46	9	24.2	
	Oct.	1	21	47	13.18	5.990	14	10	15.6	29.14	1.284 9008	2687.4	1.74	0.46	9	8.1
		5	21	46	50.42	5.381	14	12	5.6	25.84	1.286 0130	2871.2	1.73	0.45	8	52.0
	9	21	46	30.18	-4.732	-14	13	42.1	-22.38	1.287 1956	+3038.8	1.73	0.45	8	35.9	
	13	21	46	12.60	4.051	14	15	4.4	18.78	1.288 4417	3188.9	1.73	0.45	8	19.9	
	17	21	45	57.81	3.341	14	16	12.1	15.06	1.289 7444	3321.8	1.72	0.45	8	3.9	
	21	21	45	45.90	2.611	14	17	4.7	11.22	1.291 0968	3437.6	1.71	0.45	7	48.0	
	25	21	45	36.35	1.860	14	17	41.8	7.31	1.292 4922	3536.6	1.71	0.45	7	32.1	
	29	21	45	31.05	-1.088	-14	18	3.1	- 3.33	1.293 9238	+3618.6	1.70	0.45	7	16.3	
	Nov.	2	21	45	28.27	-0.301	14	18	8.3	+ 0.72	1.295 3847	3682.6	1.70	0.45	7	0.5
		6	21	45	28.66	+0.499	14	17	57.2	4.84	1.296 8673	3726.9	1.69	0.44	6	44.8
	10	21	45	32.26	1.300	14	17	29.6	8.92	1.298 3636	3751.4	1.69	0.44	6	29.2	
	14	21	45	39.05	2.095	14	16	45.8	12.99	1.299 8659	3757.0	1.68	0.44	6	13.5	
	18	21	45	49.01	+2.885	-14	15	45.7	+17.04	1.301 3670	+3746.1	1.67	0.44	5	58.0	
	22	21	46	2.12	3.668	14	14	29.6	21.02	1.302 8606	3718.9	1.67	0.44	5	42.5	
	26	21	46	18.34	4.441	14	12	57.6	24.96	1.304 3398	3674.4	1.66	0.44	5	27.0	
	30	21	46	37.63	5.200	14	11	10.0	28.82	1.305 7978	3612.8	1.66	0.43	5	11.6	
	Dec.	4	21	46	59.92	5.942	14	9	7.1	32.63	1.307 2278	3534.6	1.65	0.43	4	56.2
8		21	47	25.13	+6.661	-14	6	49.2	+36.30	1.308 6233	+3439.8	1.65	0.43	4	40.9	
	12	21	47	53.17	7.352	14	4	16.9	39.84	1.309 9775	3328.8	1.64	0.43	4	25.7	
	16	21	48	23.91	8.011	14	1	30.7	43.21	1.311 2846	3205.2	1.64	0.43	4	10.5	
	20	21	48	57.22	8.639	13	58	31.4	46.45	1.312 5400	3069.6	1.63	0.43	3	55.3	
	24	21	49	32.98	9.238	13	55	19.3	49.56	1.313 7386	2920.9	1.63	0.43	3	40.2	
	28	21	50	11.08	+9.804	-13	51	55.1	+52.50	1.314 8751	+2760.6	1.62	0.43	3	25.1	
32	21	50	51.37	.....	-13	48	19.5	.....	1.315 9455	.....	1.62	0.43	3	10.0	

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	"	"	" ' "	"		
Jan.	0	323 13 47.4	38.97	+6.1	-0 43 27.2	-0.18	1.300 8489	+16.5
	10	323 20 17.1	38.97	6.1	0 43 29.0	0.18	1.300 8654	16.4
	20	323 26 46.8	38.97	6.0	0 43 30.8	0.18	1.300 8817	16.3
	30	323 33 16.5	38.96	+6.0	-0 43 32.6	-0.18	1.300 8980	+16.3
Feb.	9	323 39 46.1	38.96	6.0	0 43 34.4	0.18	1.300 9143	16.3
	19	323 46 15.7	38.96	5.9	0 43 36.1	0.18	1.300 9305	16.2
Mar.	1	323 52 45.2	38.95	+5.9	-0 43 37.9	-0.18	1.300 9466	+16.1
	11	323 59 14.7	38.95	5.9	0 43 39.6	0.18	1.300 9627	16.0
	21	324 5 44.2	38.94	5.9	0 43 41.4	0.18	1.300 9787	16.0
	31	324 12 13.6	38.94	+5.9	-0 43 43.1	-0.18	1.300 9947	+16.0
Apr.	10	324 18 43.0	38.94	5.8	0 43 44.9	0.18	1.301 0106	15.9
	20	324 25 12.3	38.93	5.8	0 43 46.6	0.17	1.301 0264	15.8
	30	324 31 41.6	38.93	+5.8	-0 43 48.3	-0.17	1.301 0422	+15.7
May	10	324 38 10.9	38.92	5.7	0 43 50.0	0.17	1.301 0579	15.6
	20	324 44 40.1	38.92	5.7	0 43 51.7	0.17	1.301 0735	15.6
	30	324 51 9.3	38.92	+5.7	-0 43 53.3	-0.17	1.301 0891	+15.6
June	9	324 57 38.4	38.91	5.6	0 43 55.0	0.17	1.301 1046	15.5
	19	325 4 7.5	38.91	5.6	0 43 56.7	0.17	1.301 1201	15.4
	29	325 10 36.6	38.91	+5.6	-0 43 58.4	-0.16	1.301 1355	+15.4
July	9	325 17 5.7	38.90	5.6	0 44 0.0	0.16	1.301 1508	15.3
	19	325 23 34.7	38.90	5.5	0 44 1.6	0.16	1.301 1661	15.2
	29	325 30 3.6	38.89	+5.5	-0 44 3.2	-0.16	1.301 1813	+15.2
Aug.	8	325 36 32.5	38.89	5.5	0 44 4.8	0.16	1.301 1965	15.2
	18	325 43 1.4	38.89	5.4	0 44 6.4	0.16	1.301 2116	15.0
	28	325 49 30.3	38.88	+5.4	-0 44 8.0	-0.16	1.301 2266	+15.0
Sept.	7	325 55 59.1	38.88	5.4	0 44 9.6	0.16	1.301 2416	15.0
	17	326 2 27.9	38.88	5.4	0 44 11.2	0.16	1.301 2565	14.9
	27	326 8 56.6	38.87	+5.3	-0 44 12.8	-0.16	1.301 2714	+14.8
Oct.	7	326 15 25.3	38.87	5.3	0 44 14.4	0.15	1.301 2862	14.8
	17	326 21 54.0	38.87	5.3	0 44 15.9	0.15	1.301 3010	14.8
	27	326 28 22.7	38.86	+5.2	-0 44 17.4	-0.15	1.301 3157	+14.7
Nov.	6	326 34 51.3	38.86	5.2	0 44 18.9	0.15	1.301 3303	14.6
	16	326 41 19.9	38.86	5.2	0 44 20.4	0.15	1.301 3449	14.6
	26	326 47 48.4	38.85	+5.2	-0 44 21.9	-0.15	1.301 3594	+14.5
Dec.	6	326 54 16.9	38.84	5.1	0 44 23.4	0.15	1.301 3739	14.5
	16	327 0 45.3	38.84	5.1	0 44 24.9	0.15	1.301 3884	14.4
	26	327 7 13.8	38.84	+5.1	-0 44 26.4	-0.15	1.301 4027	+14.3
	36	327 13 42.2	38.84	+5.0	-0 44 27.9	-0.15	1.301 4170	+14.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Day.	Apparent Declination.			Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	Noon.				Noon.									Noon.
		h	m	s		°	'	"					h	m
Jan.	2	8	34	51.29	-6.088	+18	31	27.3	+22.80	1.464 5158	-1093.6	1.33	0.30	13 47.3
	6	8	34	26.43	6.335	18	33	0.3	23.66	1.464 1121	923.8	1.33	0.30	13 31.1
	10	8	34	0.67	6.539	18	34	36.4	24.38	1.463 7777	747.2	1.33	0.30	13 15.0
	14	8	33	34.18	6.701	18	36	15.1	24.94	1.463 5149	566.2	1.33	0.30	12 58.8
	18	8	33	7.12	6.818	18	37	55.7	25.32	1.463 3251	382.5	1.33	0.30	12 42.6
	22	8	32	39.70	-6.886	+18	39	37.4	+25.51	1.463 2091	- 196.9	1.33	0.30	12 26.5
Feb.	26	8	32	12.09	6.911	18	41	19.6	25.56	1.463 1676	- 11.2	1.33	0.30	12 10.3
	30	8	31	44.47	6.894	18	43	1.7	25.45	1.463 2001	+ 174.0	1.33	0.30	11 54.1
	3	8	31	17.00	6.832	18	44	43.0	25.19	1.463 3068	358.8	1.33	0.30	11 37.9
	7	8	30	49.88	6.724	18	46	23.0	24.78	1.463 4869	541.5	1.33	0.30	11 21.7
	11	8	30	23.27	-6.574	+18	48	0.9	+24.18	1.463 7396	+ 721.4	1.33	0.30	11 5.6
	15	8	29	57.35	6.378	18	49	36.2	23.44	1.464 0634	896.8	1.33	0.30	10 49.4
Mar.	19	8	29	32.31	6.138	18	51	8.2	22.55	1.464 4561	1064.9	1.33	0.30	10 33.3
	23	8	29	8.30	5.861	18	52	36.5	21.55	1.464 9144	1226.0	1.33	0.30	10 17.2
	27	8	28	45.47	5.549	18	54	0.4	20.40	1.465 4360	1380.4	1.32	0.30	10 1.0
	3	8	28	23.96	-5.202	+18	55	19.6	+19.18	1.466 0176	+1526.6	1.32	0.30	9 45.0
	7	8	28	3.89	4.828	18	56	33.7	17.83	1.466 6562	1605.1	1.32	0.30	9 28.9
	11	8	27	45.38	4.420	18	57	42.1	16.36	1.467 3484	1793.6	1.32	0.30	9 12.9
Apr.	15	8	27	28.58	3.978	18	58	44.5	14.82	1.468 0898	1912.0	1.32	0.30	8 56.9
	19	8	27	13.60	3.511	18	59	40.6	13.20	1.468 8765	2019.1	1.31	0.30	8 40.9
	23	8	27	0.51	-3.030	+19	0	30.0	+11.50	1.469 7035	+2113.9	1.31	0.30	8 24.9
	27	8	26	49.38	2.531	19	1	12.5	9.75	1.470 5662	2198.5	1.31	0.30	8 9.0
	31	8	26	40.29	2.016	19	1	48.0	7.99	1.471 4608	2271.5	1.31	0.30	7 53.2
	4	8	26	33.26	1.490	19	2	16.3	6.15	1.472 3819	2332.9	1.30	0.30	7 37.3
May	8	8	26	28.37	0.951	19	2	37.1	4.26	1.473 3256	2383.6	1.30	0.30	7 21.5
	12	8	26	25.66	-0.404	+19	2	50.4	+ 2.38	1.474 2871	+2421.5	1.30	0.29	7 5.8
	16	8	26	25.14	+0.145	19	2	56.1	+ 0.48	1.475 2612	2447.4	1.29	0.29	6 50.0
	20	8	26	26.82	0.694	19	2	54.2	- 1.42	1.476 2433	2460.2	1.29	0.29	6 34.3
	24	8	26	30.69	1.240	19	2	44.7	3.32	1.477 2279	2461.5	1.29	0.29	6 18.7
	28	8	26	36.74	1.781	19	2	27.6	5.20	1.478 2112	2453.1	1.29	0.29	6 3.0
June	2	8	26	44.93	+2.315	+19	2	3.1	- 7.06	1.479 1890	+2434.0	1.28	0.29	5 47.4
	6	8	26	55.24	2.841	19	1	31.0	8.92	1.480 1570	2404.6	1.28	0.29	5 31.9
	10	8	27	7.66	3.362	19	0	51.7	10.75	1.481 1112	2364.0	1.28	0.29	5 16.4
	14	8	27	22.12	3.865	19	0	5.0	12.55	1.482 0467	2311.5	1.27	0.29	5 0.9
	18	8	27	38.56	4.352	18	59	11.4	14.26	1.482 9592	2250.3	1.27	0.29	4 45.4
	22	8	27	56.92	+4.823	+18	58	10.9	-15.96	1.483 8457	+2180.2	1.27	0.29	4 30.0
July	26	8	28	17.12	5.274	18	57	3.8	17.58	1.484 7022	2101.2	1.27	0.29	4 14.6
	30	8	28	39.09	5.705	18	55	50.3	19.15	1.485 5257	2015.1	1.26	0.29	3 59.3
	3	8	29	2.73	6.114	18	54	30.7	20.65	1.486 3133	1921.5	1.26	0.29	3 43.9
	7	8	29	27.98	6.505	18	53	5.1	22.11	1.487 0617	1818.7	1.26	0.29	3 28.6
	11	8	29	54.75	+6.873	+18	51	33.9	-23.49	1.487 7673	+1708.4	1.26	0.29	3 13.3
	15	8	30	22.93	7.212	18	49	57.2	24.79	1.488 4276	1592.4	1.26	0.29	2 58.1
August	19	8	30	52.41	7.524	18	48	15.6	25.99	1.489 0404	1470.1	1.25	0.28	2 42.8
	23	8	31	23.09	7.809	18	46	29.4	27.10	1.489 6031	1343.6	1.25	0.28	2 27.6
	27	8	31	54.84	8.065	18	44	38.9	28.14	1.490 1147	1212.6	1.25	0.28	2 12.4
	1	8	32	27.59	+8.302	+18	42	44.4	-29.10	1.490 5725	+1075.9	1.25	0.28	1 57.2
	5	8	33	1.22	+8.506	+18	40	46.2	-29.98	1.490 9749	+ 935.9	1.25	0.28	1 42.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Day.	Apparent Declination.			Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"			"	"	h	m
July	1	8 32	27.59	+8.302	+18 42	44.4	-29.10	1.490 5725	+1075.9	1.25	0.28	1 57.2		
	5	8 33	1.22	8.506	18 40	46.2	29.98	1.490 9749	935.9	1.25	0.28	1 42.1		
	9	8 33	35.60	8.680	18 38	44.8	30.71	1.491 3207	791.7	1.25	0.28	1 26.9		
	13	8 34	10.63	8.826	18 36	40.6	31.26	1.491 6079	644.4	1.25	0.28	1 11.8		
	17	8 34	46.16	8.936	18 34	34.0	31.91	1.491 8359	494.6	1.25	0.28	0 56.6		
	21	8 35	22.09	+9.021	+18 32	25.4	-32.35	1.492 0035	+ 344.1	1.24	0.28	0 41.5		
	25	8 35	58.28	9.071	18 30	15.4	32.66	1.492 1111	192.9	1.24	0.28	0 26.4		
	29	8 36	34.62	9.095	18 28	4.1	32.90	1.492 1576	+ 40.0	1.24	0.28	0 11.2		
	Aug.	2	8 37	11.01	9.092	18 25	52.2	33.01	1.492 1430	- 113.9	1.24	0.28	23 52.3	
		6	8 37	47.31	9.054	18 23	40.0	33.01	1.492 0665	268.0	1.24	0.28	23 37.2	
10		8 38	23.40	+8.985	+18 21	28.1	-32.90	1.491 9287	- 421.1	1.25	0.28	23 22.0		
14		8 38	59.15	8.884	18 19	16.9	32.65	1.491 7298	573.1	1.25	0.28	23 6.9		
18		8 39	34.42	8.749	18 17	7.1	32.25	1.491 4706	722.1	1.25	0.28	22 51.8		
22		8 40	9.10	8.588	18 14	58.9	31.81	1.491 1525	868.4	1.25	0.28	22 36.6		
26		8 40	43.08	8.399	18 12	52.8	31.22	1.490 7763	1011.8	1.25	0.28	22 21.5		
30		8 41	16.26	+8.184	+18 10	49.2	-30.52	1.490 3434	-1153.5	1.25	0.28	22 6.3		
Sept.		3	8 41	48.51	7.935	18 8	48.8	29.66	1.489 8540	1291.6	1.25	0.28	21 51.1	
		7	8 42	19.70	7.656	18 6	52.0	28.71	1.489 3108	1423.3	1.25	0.28	21 35.9	
	11	8 42	49.72	7.349	18 4	59.2	27.64	1.488 7156	1551.5	1.25	0.29	21 20.6		
	15	8 43	18.45	7.014	18 3	11.1	26.41	1.488 0704	1672.9	1.26	0.29	21 5.4		
	19	8 43	45.80	+6.656	+18 1	27.9	-25.15	1.487 3782	-1787.2	1.26	0.29	20 50.1		
	23	8 44	11.67	6.276	17 59	50.0	23.78	1.486 6415	1895.1	1.26	0.29	20 34.8		
	27	8 44	35.99	5.871	17 58	17.9	22.36	1.485 8630	1996.3	1.26	0.29	20 19.5		
	Oct.	1	8 44	58.61	5.440	17 56	52.1	20.64	1.485 0454	2090.4	1.27	0.29	20 4.1	
		5	8 45	19.49	4.987	17 55	32.9	18.94	1.484 1918	2175.3	1.27	0.29	19 48.7	
		9	8 45	38.51	+4.516	+17 54	20.8	-17.12	1.483 3061	-2251.2	1.27	0.29	19 33.3	
13		8 45	55.60	4.028	17 53	16.0	15.26	1.482 3921	2316.9	1.27	0.29	19 17.9		
17		8 46	10.71	3.594	17 52	18.8	13.32	1.481 4540	2371.9	1.28	0.29	19 2.4		
21		8 46	23.77	3.005	17 51	29.5	11.31	1.480 4959	2417.0	1.28	0.29	18 46.9		
25		8 46	34.74	2.478	17 50	48.4	9.25	1.479 5217	2452.5	1.28	0.29	18 31.3		
29		8 46	43.58	+1.939	+17 50	15.5	- 7.16	1.478 5354	-2476.9	1.28	0.29	18 15.7		
Nov.		2	8 46	50.23	1.388	17 49	51.2	4.99	1.477 5418	2499.1	1.29	0.29	18 0.1	
		6	8 46	54.67	0.832	17 49	35.6	2.81	1.476 5458	2488.4	1.29	0.29	17 44.5	
	10	8 46	56.88	+0.275	17 49	28.7	- 0.64	1.475 5527	2475.5	1.29	0.29	17 28.8		
	14	8 46	56.87	-0.279	17 49	30.5	+ 1.55	1.474 5670	2450.4	1.30	0.29	17 13.0		
	18	8 46	54.65	-0.829	+17 49	41.1	+ 3.72	1.473 5940	-2412.9	1.30	0.30	16 57.2		
	22	8 46	50.25	1.371	17 50	0.2	5.84	1.472 6382	2364.3	1.30	0.30	16 41.4		
	26	8 46	43.69	1.906	17 50	27.8	7.94	1.471 7043	2302.9	1.30	0.30	16 25.6		
	30	8 46	35.01	2.431	17 51	3.7	10.00	1.470 7976	2228.6	1.31	0.30	16 9.7		
	Dec.	4	8 46	24.25	2.944	17 51	47.8	12.01	1.469 9230	2142.1	1.31	0.30	15 53.8	
		8	8 46	11.48	-3.485	+17 52	39.7	+13.95	1.469 0855	-2043.5	1.31	0.30	15 37.8	
12		8 45	56.81	3.898	17 53	39.0	15.72	1.468 2898	1932.3	1.32	0.30	15 21.9		
16		8 45	40.33	4.338	17 54	45.4	17.45	1.467 5407	1811.8	1.32	0.30	15 5.9		
20		8 45	22.14	4.751	17 55	58.4	19.07	1.466 8416	1682.0	1.32	0.30	14 49.9		
24		8 45	2.36	5.137	17 57	17.5	20.50	1.466 1964	1542.1	1.32	0.30	14 33.8		
28		8 44	41.09	-5.490	+17 58	42.2	+21.84	1.465 6091	-1393.1	1.32	0.30	14 17.7		
32		8 44	18.49	...	+18 0	12.1	...	1.465 0830	...	1.32	0.30	14 1.8		

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	"	"	" ' "	"		
Jan.	0	125 33 23.3	21.75	-9.2	-0 9 52.9	+0.67	1.477 6316	+4.7
	10	125 37 0.8	21.75	9.1	0 9 46.2	0.67	1.477 6362	4.6
	20	125 40 38.3	21.75	9.0	0 9 39.5	0.67	1.477 6409	4.6
	30	125 44 15.8	21.75	-8.9	-0 9 32.8	+0.67	1.477 6455	+4.6
Feb.	9	125 47 53.3	21.75	8.8	0 9 26.1	0.67	1.477 6502	4.6
	19	125 51 30.8	21.75	8.7	0 9 19.4	0.67	1.477 6548	4.6
Mar.	1	125 55 8.3	21.75	-8.5	-0 9 12.7	+0.67	1.477 6594	+4.6
	11	125 58 45.8	21.75	8.5	0 9 6.0	0.67	1.477 6640	4.6
	21	126 2 23.3	21.75	8.4	0 8 59.3	0.67	1.477 6686	4.6
	31	126 6 0.9	21.75	-8.3	-0 8 52.6	+0.67	1.477 6732	+4.6
Apr.	10	126 9 38.4	21.75	8.2	0 8 45.9	0.67	1.477 6778	4.5
	20	126 13 15.9	21.75	8.1	0 8 39.2	0.67	1.477 6823	4.5
	30	126 16 53.4	21.75	-8.0	-0 8 32.5	+0.67	1.477 6869	+4.5
May	10	126 20 30.9	21.75	7.9	0 8 25.8	0.67	1.477 6914	4.5
	20	126 24 8.4	21.75	7.8	0 8 19.1	0.67	1.477 6959	4.5
	30	126 27 45.9	21.75	-7.7	-0 8 12.4	+0.67	1.477 7004	+4.5
June	9	126 31 23.4	21.75	7.5	0 8 5.7	0.67	1.477 7049	4.5
	19	126 35 0.9	21.75	7.4	0 7 59.0	0.67	1.477 7094	4.5
	29	126 38 38.5	21.75	-7.3	-0 7 52.3	+0.67	1.477 7139	+4.5
July	9	126 42 16.0	21.75	7.2	0 7 45.6	0.67	1.477 7184	4.5
	19	126 45 53.6	21.75	7.1	0 7 38.9	0.67	1.477 7229	4.5
	29	126 49 31.1	21.75	-7.0	-0 7 32.2	+0.67	1.477 7274	+4.5
Aug.	8	126 53 8.6	21.75	6.9	0 7 25.5	0.67	1.477 7319	4.4
	18	126 56 46.1	21.75	6.8	0 7 18.8	0.67	1.477 7363	4.4
	28	127 0 23.6	21.75	-6.7	-0 7 12.1	+0.67	1.477 7407	+4.4
Sept.	7	127 4 1.1	21.75	6.6	0 7 5.4	0.67	1.477 7451	4.4
	17	127 7 38.6	21.75	6.5	0 6 58.7	0.67	1.477 7495	4.4
	27	127 11 16.1	21.75	-6.4	-0 6 52.0	+0.67	1.477 7539	+4.4
Oct.	7	127 14 53.6	21.75	6.3	0 6 45.3	0.67	1.477 7583	4.4
	17	127 18 31.2	21.75	6.2	0 6 38.6	0.67	1.477 7627	4.4
	27	127 22 8.7	21.75	-6.1	-0 6 31.9	+0.67	1.477 7671	+4.3
Nov.	6	127 25 46.2	21.75	6.0	0 6 25.2	0.67	1.477 7714	4.3
	16	127 29 23.7	21.75	5.9	0 6 18.5	0.67	1.477 7757	4.3
	26	127 33 1.2	21.75	-5.8	-0 6 11.8	+0.67	1.477 7800	+4.3
Dec.	6	127 36 38.7	21.75	5.7	0 6 5.1	0.67	1.477 7843	4.3
	16	127 40 16.2	21.75	5.6	0 5 58.4	0.67	1.477 7886	4.3
	26	127 43 53.7	21.75	-5.5	-0 5 51.7	+0.67	1.477 7929	+4.3
	36	127 47 31.3	21.75	-5.4	-0 5 45.0	+0.67	1.477 7972	+4.3

PART II.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

200 FORMULÆ FOR THE REDUCTION OF STARS, 1918.

The constants of precession, nutation and aberration adopted by the *Conférence Internationale des Étoiles Fondamentales* which met in Paris in May, 1896, are given on page xvi, and together with the notation of BESSEL are used in the formulæ which follow.

BESSELIAN STAR-NUMBERS.

<i>Terms of Long Period.</i>	<i>Terms of Short Period.</i>
$A-\tau = 0.342\ 21 \sin \Omega$	$-0.004\ 05 \sin 2 \mathfrak{C}$
$+ 0.004\ 15 \sin 2 \Omega$	$+0.000\ 23 \sin (\mathfrak{C} + \Gamma')$
$- 0.025\ 26 \sin 2 L$	$+0.001\ 34 \sin (\mathfrak{C} - \Gamma')$
$+ 0.002\ 51 \sin (L - \Gamma)$	$-0.000\ 68 \sin (2 \mathfrak{C} - \Omega)$
$- 0.000\ 99 \sin (3 L - \Gamma)$	$-0.000\ 52 \sin (3 \mathfrak{C} - \Gamma')$
$+ 0.000\ 42 \sin (L + \Gamma)$	$+0.000\ 30 \sin (\mathfrak{C} - 2 L + \Gamma')$
$+ 0.000\ 25 \sin (2 L - \Omega)$	$+0.000\ 12 \sin 2 (\mathfrak{C} - L)$
"	"
$B = - 9.210 \cos \Omega$	$-0.088 \cos 2 \mathfrak{C}$
$+ 0.090 \cos 2 \Omega$	$-0.018 \cos (2 \mathfrak{C} - \Omega)$
$- 0.551 \cos 2 L$	$-0.011 \cos (3 \mathfrak{C} - \Gamma')$
$- 0.022 \cos (3 L - \Gamma)$	$+0.005 \cos (\mathfrak{C} + \Gamma')$
$+ 0.009 \cos (L + \Gamma)$	
$+ 0.007 \cos (2 L - \Omega)$	
$C = -20.4700 \cos \omega \cos \odot$	
$D = -20.4700 \sin \odot$	
$E = - 0.0415 \sin \Omega + 0''.0005 \sin 2 \Omega - 0''.0031 \sin 2 L$	

BESSEL'S Star-Constants.

$a = 3^s.072\ 67 + 1^s.336\ 36 \sin \alpha_0 \tan \delta_0$	$a' = 20''.0453 \cos \alpha_0$
$b = \frac{1}{\tan \alpha_0} \cos \alpha_0 \tan \delta_0$	$b' = -\sin \alpha_0$
$c = \frac{1}{\tan \alpha_0} \cos \alpha_0 \sec \delta_0$	$c' = \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0$
$d = \frac{1}{\tan \alpha_0} \sin \alpha_0 \sec \delta_0$	$d' = \cos \alpha_0 \sin \delta_0$

Formulæ for Reduction to Apparent Position.

$$\alpha = \alpha_0 + \tau \mu + Aa + Bb + Cc + Dd + \frac{1}{\tan \alpha_0} E \quad (\text{in time})$$

$$\delta = \delta_0 + \tau \mu' + Aa' + Bb' + Cc' + Dd' \quad (\text{in arc})$$

INDEPENDENT STAR-NUMBERS.

$$f + f' = +46''.0900 A + E \quad (\text{in arc})$$

$$= +3^s.07267 A + \frac{1}{\tan \alpha_0} E \quad (\text{in time})$$

$$f' = -0^s.0124 \sin 2 \mathfrak{C} + 0^s.0041 \sin (\mathfrak{C} - \Gamma') + 0^s.0007 \sin (\mathfrak{C} + \Gamma')$$

$$- 0^s.0021 \sin (2 \mathfrak{C} - \Omega) - 0^s.0016 \sin (3 \mathfrak{C} - \Gamma')$$

$$+ 0^s.0009 \sin (\mathfrak{C} - 2 L + \Gamma') + 0^s.0004 \sin 2 (\mathfrak{C} - L)$$

$$g \sin G = B \quad h \sin H = C \quad i = C \tan \omega$$

$$g \cos G = 20''.0453 A \quad h \cos H = D$$

Formulæ for Reduction to Apparent Position.

$$\alpha = \alpha_0 + f + f' + \tau \mu + \frac{1}{\tan \alpha_0} g \sin (G + \alpha_0) \tan \delta_0 + \frac{1}{\tan \alpha_0} h \sin (H + \alpha_0) \sec \delta_0 \quad (\text{in time})$$

$$\delta = \delta_0 + \tau \mu' + g \cos (G + \alpha_0) + h \cos (H + \alpha_0) \sin \delta_0 + i \cos \delta_0 \quad (\text{in arc})$$

In the above formulæ,

τ denotes the time reckoned in units of one year, from the beginning of the Besselian fictitious year (1918, January 0^d.459, Washington mean time),

α_0, δ_0 , the star's mean R. A. and Decl. at the beginning of the fictitious year,
 α, δ , the star's apparent right ascension and declination at the time τ ,
 μ, μ' , the annual proper motion in right ascension and declination,

\odot , the Sun's true longitude,
 L , the Sun's mean longitude,
 Ω , the longitude of the Moon's
ascending node,

ω , the obliquity of the ecliptic,
 Γ , the long. of the Sun's perigee,
 Γ' , the long. of the Moon's perigee,
 \mathfrak{C} , the Moon's mean longitude.

The independent star-numbers are more convenient than BESSEL'S when only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy.

In using the star-constants of the *British Association Catalogue*, $a, b, c, d, a', b', c', d'$, with the star-numbers of this Ephemeris, the quantities to be computed are $Ac, Bd, Ca, Db, -Ac', -Bd', -Ca', -Db'$.

In the computation of the Besselian star-numbers given for Washington mean midnight of each day of the year, on pages 202-205, the short-period terms—that is, the terms involving the Moon's mean longitude—have been included.

In the computation of the independent star-numbers, pages 206-213, the short-period terms have been included in the two columns headed G and $\text{Log } g$. The quantities f and f' give separately the effect of the long-period and short-period terms. f' differs but slightly from the quantity $-0''.1866 \sin 2 \zeta + 0''.0622 \sin (\zeta - \Gamma')$ given on page 37 of the *Procès-Verbaux* of the Paris Conference of 1896, which quantity that conference decided should be omitted in the reduction of stars from mean to apparent place.

In computing the ephemerides of the circumpolar stars in this volume, all short-period terms have been included. The quantity f' , which was omitted from the ephemerides of the circumpolar stars given in the *American Ephemeris and Nautical Almanac* for the years 1900 to 1915, inclusive, is now included in these ephemerides in accordance with the decision of the *Congrès International des Éphémérides Astronomiques* held in Paris in October, 1911. See page 43 of *Procès-Verbaux* of that Congress.

In the computation of the ephemerides of the ten-day stars, no short-period terms have been included. These terms attain two maxima and two minima during the tropical month. At maximum and minimum they may amount in right ascension to $\pm 0''.008 \tan \delta$, and in declination to $\pm 0''.13$. For computing the effect of these terms for the correction of the positions of stars interpolated from the ten-day ephemerides, the following formulæ may be used, in which $\Delta\alpha$ and $\Delta\delta$ denote the effect of the short-period terms in right ascension and declination, respectively, and $\delta''\psi$ and $\delta''\omega$, the sum of the short-period terms of the nutation in longitude and obliquity:

$$\begin{aligned}\Delta\alpha &= D_{\psi}\alpha \delta''\psi + D_{\omega}\alpha \delta''\omega \\ \Delta\delta &= D_{\psi}\delta \delta''\psi + D_{\omega}\delta \delta''\omega\end{aligned}$$

The values of $\delta''\psi$ and of $\delta''\omega$ for Washington mean midnight are given for each day of the year on pages 215-216, and have been computed as follows:

$$\delta''\psi = 50''.37 A_2 \qquad \delta''\omega = -B_2$$

in which A_2 and B_2 are the sums of the short-period terms given in the expressions for A and B on page 200.

The quantities $D_{\psi}\alpha$, $D_{\omega}\alpha$, $D_{\psi}\delta$, and $D_{\omega}\delta$ are given for each ten-day star on pages 316-513, and have been computed by means of the following formulæ:

$$\begin{aligned}D_{\psi}\alpha &= \frac{1}{15} (\cos \omega + \sin \alpha \tan \delta \sin \omega) & D_{\omega}\alpha &= -\frac{1}{15} \cos \alpha \tan \delta \\ D_{\psi}\delta &= \cos \alpha \sin \omega & D_{\omega}\delta &= \sin \alpha\end{aligned}$$

In the *Star List of the American Ephemeris* for the years 1910 and 1911 and in the *American Ephemeris and Nautical Almanac* for the years 1912 to 1915, inclusive, the value used for the derivative of the right ascension with reference to ψ was

$$D'\psi\alpha = \frac{1}{15} \sin \alpha \tan \delta \sin \omega$$

and the addition of the term $\frac{1}{15} \cos \omega$ is made in accordance with the above-mentioned decision of the *Congrès International des Éphémérides Astronomiques* of 1911 with reference to the quantity f' .

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.		
Jan. 0	+9.54964	+9.3707	-0.51322	+1.30447	Feb. 15	+9.69099	-9.0224	-1.19598	+1.05027		
1	9.55243	9.3232	0.55491	1.30304	16	9.69310	8.8344	1.20090	1.03838		
2	9.55475	9.2971	0.59282	1.30146	17	9.69599	8.5514	1.20563	1.02602		
3	9.55686	9.2984	0.62756	1.29975	18	9.69943	8.2175	1.21017	1.01316		
h (7.0)	4	9.55907	9.3270	0.65960	1.29788	h (10.0)	19	9.70311	8.2304	1.21454	0.99979
5	+9.56171	+9.3755	-0.68931	+1.29587	20	+9.70662	-8.5752	-1.21872	+0.98586		
6	9.56503	9.4310	0.71698	1.29372	21	9.70961	8.8704	1.22273	0.97133		
7	9.56921	9.4834	0.74287	1.29141	22	9.71190	9.0752	1.22657	0.95617		
8	9.57422	9.5247	0.76718	1.28895	23	9.71346	9.2151	1.23024	0.94033		
9	9.58001	9.5480	0.79006	1.28634	24	9.71441	9.3064	1.23374	0.92376		
10	+9.58629	+9.5495	-0.81167	+1.28358	25	+9.71491	-9.3614	-1.23709	+0.90640		
11	9.59252	9.5254	0.83212	1.28065	26	9.71516	9.3858	1.24027	0.88819		
12	9.59815	9.4739	0.85152	1.27758	27	9.71539	9.3829	1.24330	0.86905		
13	9.60284	9.3957	0.86995	1.27434	28	9.71575	9.3560	1.24617	0.84890		
14	9.60641	9.2973	0.88750	1.27094	Mar. 1	9.71646	9.3058	1.24888	0.82764		
15	+9.60886	+9.1973	-0.90424	+1.26738	2	+9.71771	-9.2330	-1.25145	+0.80516		
16	9.61055	9.1307	0.92021	1.26365	3	9.71953	9.1421	1.25387	0.78131		
17	9.61207	9.1335	0.93549	1.25975	4	9.72194	9.0500	1.25615	0.75596		
18	9.61396	9.1973	0.95011	1.25567	5	9.72487	8.9903	1.25825	0.72890		
h (8.0)	19	9.61665	9.2849	0.96411	1.25142	h (11.0)	6	9.72803	9.0035	1.26026	0.69991
20	+9.62031	+9.3623	-0.97754	+1.24699	7	+9.73111	-9.0864	-1.26211	+0.66872		
21	9.62485	9.4145	0.99044	1.24238	8	9.73378	9.1992	1.26381	0.63499		
22	9.62991	9.4349	1.00282	1.23758	9	9.73578	9.3054	1.26537	0.59829		
23	9.63507	9.4214	1.01473	1.23259	10	9.73698	9.3847	1.26680	0.55811		
24	9.63987	9.3727	1.02618	1.22741	11	9.73754	9.4298	1.26809	0.51363		
25	+9.64399	+9.2876	-1.03720	+1.22202	12	+9.73772	-9.4387	-1.26924	+0.46399		
26	9.64726	9.1626	1.04781	1.21644	13	9.73791	9.4089	1.27026	0.40782		
27	9.64970	8.9921	1.05804	1.21064	14	9.73849	9.3383	1.27115	0.34319		
28	9.65147	8.7657	1.06789	1.20463	15	9.73977	9.2258	1.27190	0.26711		
29	9.65274	8.4800	1.07739	1.19839	16	9.74180	9.0722	1.27252	0.17472		
30	+9.65377	+8.1900	-1.08655	+1.19193	17	+9.74446	-8.8965	-1.27300	+0.05712		
31	9.65485	8.1644	1.09538	1.18523	18	9.74743	8.7627	1.27336	9.89528		
Feb. 1	9.65615	8.4133	1.10390	1.17829	19	9.75039	8.7536	1.27358	9.63440		
2	9.65787	8.6674	1.11213	1.17110	20	9.75295	8.8639	1.27368	+8.88188		
h (9.0)	3	9.66023	8.8537	1.12006	1.16366	h (12.0)	21	9.75494	9.0009	1.27364	-9.44456
4	+9.66330	+8.9764	-1.12772	+1.15595	22	+9.75630	-9.1139	-1.27347	-9.80110		
5	9.66706	9.0378	1.13511	1.14796	23	9.75706	9.1898	1.27318	9.99403		
6	9.67128	9.0366	1.14224	1.13969	24	9.75736	9.2279	1.27275	0.12700		
7	9.67564	8.9518	1.14912	1.13112	25	9.75742	9.2294	1.27219	0.22849		
8	9.67971	8.7143	1.15576	1.12224	26	9.75742	9.1923	1.27150	0.31055		
9	+9.68314	+6.4771	-1.16216	+1.11304	27	+9.75754	-9.1058	-1.27069	-0.37939		
10	9.68570	-8.7443	1.16833	1.10351	28	9.75795	8.9450	1.26974	0.43866		
11	9.68735	9.0200	1.17428	1.09362	29	9.75879	-8.6117	1.26866	0.49065		
12	9.68830	9.1377	1.18002	1.08337	30	9.76015	+7.9345	1.26745	0.53695		
13	9.68891	9.1700	1.18554	1.07275	31	9.76206	8.7380	1.26610	0.57864		
14	+9.68966	-9.1303	-1.19086	+1.06172	Apr. 1	+9.76448	+8.9576	-1.26463	-0.61654		
15	+9.69099	-9.0224	-1.19598	+1.05027	2	+9.76720	+9.0457	-1.26302	-0.65126		

FOR WASHINGTON MEAN MIDNIGHT.

Star Day. d. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.
r. 1	+9.76448	+8.9576	-1.26463	-0.61654	May 17	+9.84443	+0.0238	-1.01611	-1.23199
2	9.76720	9.0457	1.26302	0.65126	18	9.84532	0.0260	1.00490	1.23674
3	9.76998	9.0542	1.26128	0.68328	19	9.84605	0.0338	0.99327	1.24132
4	9.77250	8.9965	1.25940	0.71296	20	9.84681	0.0469	0.98120	1.24572
h 5	9.77446	8.8745	1.25739	0.74061	21	9.84776	0.0640	0.96867	1.24996
h 6	+9.77578	+8.7007	-1.25524	-0.76648	h (16.0) 22	+9.84902	+0.0836	-0.95565	-1.25403
7	9.77650	8.5465	1.25295	0.79075	23	9.85066	0.1038	0.94210	1.25794
8	9.77678	8.5911	1.25052	0.81361	24	9.85273	0.1229	0.92799	1.26170
9	9.77699	8.8241	1.24795	0.83519	25	9.85523	0.1390	0.91329	1.26530
10	9.77748	9.0641	1.24524	0.85561	26	9.85807	0.1507	0.89796	1.26875
11	+9.77860	+9.2546	-1.24239	-0.87499	27	+9.86105	+0.1568	-0.88194	-1.27205
12	9.78044	9.3930	1.23939	0.89341	28	9.86399	0.1574	0.86519	1.27521
13	9.78295	9.4871	1.23624	0.91094	29	9.86662	0.1533	0.84764	1.27822
14	9.78586	9.5452	1.23295	0.92766	30	9.86876	0.1465	0.82923	1.28109
15	9.78886	9.5733	1.22960	0.94364	31	9.87035	0.1402	0.80989	1.28382
16	+9.79163	+9.5782	-1.22590	-0.95891	June 1	+9.87147	+0.1377	-0.78952	-1.28641
17	9.79391	9.5673	1.22215	0.97353	2	9.87231	0.1414	0.76802	1.28886
18	9.79561	9.5491	1.21823	0.98754	3	9.87321	0.1518	0.74528	1.29118
19	9.79672	9.5334	1.21416	1.00099	4	9.87443	0.1676	0.72116	1.29336
20	9.79742	9.5289	1.20993	1.01390	h 5	9.87618	0.1857	0.69550	1.29541
h 21	+9.79781	+9.5402	-1.20552	-1.02631	h (17.0) 6	+9.87854	+0.2030	-0.66810	-1.29734
h 22	9.79811	9.5687	1.20095	1.03824	7	9.88139	0.2166	0.63874	1.29913
23	9.79852	9.6104	1.19621	1.04973	8	9.88453	0.2247	0.60712	1.30079
24	9.79914	9.6596	1.19129	1.06079	9	9.88767	0.2272	0.57289	1.30233
25	9.80012	9.7110	1.18619	1.07145	10	9.89052	0.2248	0.53561	1.30374
26	+9.80160	+9.7597	-1.18090	-1.08173	11	+9.89294	+0.2192	-0.49471	-1.30502
27	9.80356	9.8022	1.17542	1.09164	12	9.89486	0.2126	0.44942	1.30618
28	9.80599	9.8363	1.16976	1.10120	13	9.89633	0.2070	0.39874	1.30722
29	9.80878	9.8579	1.16389	1.11044	14	9.89742	0.2042	0.34124	1.30813
30	9.81167	9.8689	1.15782	1.11935	15	9.89835	0.2048	0.27481	1.30892
iy 1	+9.81441	+9.8696	-1.15154	-1.12796	16	+9.89926	+0.2091	-0.19624	-1.30959
2	9.81675	9.8624	1.14504	1.13627	17	9.90027	0.2167	0.10011	1.31014
3	9.81852	9.8523	1.13832	1.14431	18	9.90148	0.2266	0.97634	1.31057
4	9.81971	9.8457	1.13138	1.15207	19	9.90300	0.2375	9.80244	1.31087
5	9.82045	9.8487	1.12419	1.15957	h 20	9.90491	0.2483	9.50780	1.31105
h 6	+9.82101	+9.8646	-1.11676	-1.16682	h (18.0) 21	+9.90717	+0.2576	-7.97040	-1.31112
h 7	9.82173	9.8927	1.10908	1.17383	22	9.90978	0.2641	+9.48176	1.31106
8	9.82295	9.9278	1.10114	1.18060	23	9.91255	0.2668	9.78935	1.31089
9	9.82483	9.9638	1.09293	1.18714	24	9.91534	0.2651	9.96750	1.31059
10	9.82736	9.9949	1.08444	1.19346	25	9.91794	0.2594	0.09337	1.31017
11	+9.83036	+0.0183	-1.07565	-1.19956	26	+9.92012	+0.2511	+0.19074	-1.30963
12	9.83359	0.0323	1.06657	1.20546	27	9.92180	0.2421	0.27013	1.30897
13	9.83667	0.0375	1.05716	1.21115	28	9.92303	0.2350	0.33712	1.30819
14	9.83941	0.0362	1.04743	1.21664	29	9.92392	0.2321	0.39504	1.30729
15	9.84160	0.0313	1.03736	1.22194	30	9.92472	0.2348	0.44603	1.30626
16	+9.84325	+0.0262	-1.02692	-1.22706	July 1	+9.92570	+0.2425	+0.49156	-1.30511
17	+9.84443	+0.0238	-1.01611	-1.23199	2	+9.92710	+0.2536	+0.53265	-1.30384

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log
July 1	+9.92570	+0.2425	+0.49156	-1.30511	Aug. 16	+9.99205	+0.2066	+1.17879	-1.0
2	9.92710	0.2536	0.53265	1.30384	17	9.99386	0.2034	1.18410	1.0
3	9.92900	0.2650	0.57008	1.30244	18	9.99565	0.1956	1.18921	1.0
4	9.93138	0.2742	0.60443	1.30092	19	9.99724	0.1836	1.19415	1.0
5	9.93408	0.2793	0.63616	1.29927	20	9.99846	0.1692	1.19892	1.0
h 6	+9.93686	+0.2795	+0.66561	-1.29750	h (22.0) 21	+9.99929	+0.1548	+1.20351	-1.0
(19.0) 7	9.93946	0.2750	0.69307	1.29560	22	9.99978	0.1438	1.20794	1.0
8	9.94170	0.2670	0.71880	1.29356	23	0.00002	0.1387	1.21220	1.0
9	9.94352	0.2573	0.74297	1.29140	24	0.00027	0.1406	1.21630	0.9
10	9.94490	0.2479	0.76575	1.28910	25	0.00070	0.1488	1.22024	0.9
11	+9.94593	+0.2405	+0.78728	-1.28667	26	+0.00148	+0.1600	+1.22403	-0.9
12	9.94670	0.2363	0.80768	1.28411	27	0.00271	0.1713	1.22766	0.9
13	9.94738	0.2356	0.82705	1.28141	28	0.00427	0.1792	1.23114	0.9
14	9.94815	0.2381	0.84548	1.27857	29	0.00602	0.1817	1.23448	0.9
15	9.94906	0.2430	0.86304	1.27559	30	0.00778	0.1783	1.23767	0.9
16	+9.95022	+0.2496	+0.87980	-1.27248	31	+0.00932	+0.1695	+1.24071	-0.8
17	9.95166	0.2566	0.89583	1.26921	Sept. 1	0.01053	0.1572	1.24361	0.8
18	9.95343	0.2627	0.91117	1.26580	2	0.01135	0.1437	1.24637	0.8
19	9.95551	0.2666	0.92587	1.26224	3	0.01181	0.1317	1.24899	0.8
20	9.95780	0.2673	0.93988	1.25853	4	0.01202	0.1233	1.25147	0.8
h 21	+9.96017	+0.2638	+0.95352	-1.25467	h (23.0) 5	+0.01208	+0.1195	+1.25381	-0.7
(20.0) 22	9.96242	0.2562	0.96654	1.25065	6	0.01213	0.1208	1.25602	0.7
23	9.96434	0.2453	0.97907	1.24647	7	0.01228	0.1264	1.25810	0.7
24	9.96584	0.2329	0.99113	1.24212	8	0.01259	0.1349	1.26004	0.7
25	9.96693	0.2213	1.00275	1.23761	9	0.01311	0.1448	1.26185	0.6
26	+9.96764	+0.2134	+1.01396	-1.23293	10	+0.01391	+0.1549	+1.26353	-0.6
27	9.96818	0.2110	1.02476	1.22807	11	0.01497	0.1633	1.26508	0.6
28	9.96877	0.2144	1.03518	1.22304	12	0.01626	0.1688	1.26650	0.5
29	9.96966	0.2222	1.04525	1.21782	13	0.01768	0.1703	1.26779	0.5
30	9.97098	0.2317	1.05498	1.21242	14	0.01913	0.1667	1.26895	0.4
31	+9.97275	+0.2399	+1.06438	-1.20682	15	+0.02045	+0.1587	+1.26998	-0.4
Aug. 1	9.97483	0.2445	1.07346	1.20102	16	0.02149	0.1478	1.27088	0.3
2	9.97706	0.2441	1.08224	1.19502	17	0.02220	0.1364	1.27166	0.2
3	9.97922	0.2384	1.09073	1.18882	18	0.02258	0.1275	1.27231	0.2
4	9.98110	0.2283	1.09894	1.18240	19	0.02269	0.1242	1.27284	0.1
h 5	+9.98258	+0.2157	+1.10688	-1.17575	h 20	+0.02276	+0.1282	+1.27324	-9.9
(21.0) 6	9.98366	0.2027	1.11456	1.16888	(0.0) 21	0.02295	0.1389	1.27351	9.7
7	9.98437	0.1914	1.12200	1.16177	22	0.02346	0.1541	1.27365	-9.3
8	9.98484	0.1834	1.12918	1.15441	23	0.02437	0.1701	1.27367	+9.0
9	9.98520	0.1794	1.13614	1.14681	24	0.02566	0.1835	1.27356	9.6
10	+9.98556	+0.1795	+1.14286	-1.13894	25	+0.02719	+0.1922	+1.27333	+9.9
11	9.98604	0.1829	1.14937	1.13080	26	0.02880	0.1950	1.27296	0.0
12	9.98672	0.1884	1.15566	1.12238	27	0.03025	0.1925	1.27247	0.1
13	9.98763	0.1950	1.16174	1.11366	28	0.03143	0.1862	1.27185	0.2
14	9.98884	0.2012	1.16762	1.10464	29	0.03224	0.1780	1.27110	0.3
15	+9.99034	+0.2054	+1.17330	-1.09530	30	+0.03270	+0.1709	+1.27022	+0.4
16	+9.99205	+0.2066	+1.17879	-1.08562	Oct. 1	+0.03289	+0.1669	+1.26922	+0.4

FOR WASHINGTON MEAN MIDNIGHT.

Star Dav. id. Hr.)		Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)		Log A.	Log B.	Log C.	Log D.
ct.	1	+0.03289	+0.1669	+1.26922	+0.46545	Nov. 16		+0.07079	+0.4187	+1.04233	+1.21938
	2	0.03291	0.1671	1.26807	0.51430	17		0.07218	0.4304	1.03159	1.22482
	3	0.03289	0.1718	1.26680	0.55813	18		0.07391	0.4399	1.02044	1.23006
	4	0.03295	0.1805	1.26539	0.59784	19		0.07582	0.4464	1.00884	1.23511
	5	0.03316	0.1920	1.26385	0.63412	20		0.07776	0.4494	0.99679	1.23997
h						h					
1.0)	6	+0.03359	+0.2050	+1.26217	+0.66750	(4.0)	21	+0.07951	+0.4495	+0.98425	+1.24464
	7	0.03427	0.2183	1.26036	0.69839	22		0.08099	0.4476	0.97119	1.24913
	8	0.03519	0.2303	1.25841	0.72713	23		0.08212	0.4454	0.95758	1.25345
	9	0.03636	0.2401	1.25631	0.75397	24		0.08294	0.4439	0.94338	1.25759
	10	0.03769	0.2466	1.25408	0.77915	25		0.08355	0.4443	0.92856	1.26156
	11	+0.03909	+0.2492	+1.25170	+0.80283	26		+0.08405	+0.4469	+0.91307	+1.26536
	12	0.04042	0.2480	1.24918	0.82517	27		0.08457	0.4518	0.89685	1.26899
	13	0.04155	0.2441	1.24651	0.84631	28		0.08517	0.4583	0.87986	1.27246
	14	0.04238	0.2391	1.24370	0.86635	29		0.08596	0.4660	0.86203	1.27578
	15	0.04288	0.2355	1.24073	0.88539	30		0.08696	0.4739	0.84328	1.27893
	16	+0.04312	+0.2354	+1.23761	+0.90352	Dec. 1		+0.08818	+0.4816	+0.82354	+1.28192
	17	0.04327	0.2406	1.23434	0.92080	2		0.08960	0.4883	0.80271	1.28476
	18	0.04351	0.2512	1.23090	0.93731	3		0.09121	0.4934	0.78068	1.28745
	19	0.04402	0.2657	1.22731	0.95309	4		0.09293	0.4964	0.75732	1.28998
h						h					
2.0)	20	0.04490	0.2816	1.22355	0.96820	(5.0)	5	0.09468	0.4972	0.73248	1.29237
	21	+0.04619	+0.2963	+1.21963	+0.98269	6		+0.09628	+0.4959	+0.70598	+1.29461
	22	0.04778	0.3075	1.21553	0.99659	7		0.09766	0.4932	0.67760	1.29670
	23	0.04951	0.3145	1.21126	1.00994	8		0.09878	0.4902	0.64710	1.29864
	24	0.05115	0.3169	1.20681	1.02277	9		0.09960	0.4881	0.61413	1.30044
	25	0.05259	0.3159	1.20218	1.03511	10		0.10023	0.4883	0.57829	1.30210
	26	+0.05369	+0.3131	+1.19737	+1.04699	11		+0.10083	+0.4913	+0.53908	+1.30362
	27	0.05442	0.3103	1.19236	1.05844	12		0.10154	0.4970	0.49582	1.30499
	28	0.05488	0.3094	1.18716	1.06946	13		0.10252	0.5046	0.44760	1.30623
	29	0.05515	0.3113	1.18176	1.08010	14		0.10387	0.5125	0.39318	1.30732
	30	0.05535	0.3164	1.17616	1.09035	15		0.10555	0.5193	0.33080	1.30827
	31	+0.05561	+0.3245	+1.17034	+1.10025	16		+0.10747	+0.5237	+0.25775	+1.30909
Nov.	1	0.05599	0.3346	1.16431	1.10980	17		0.10945	0.5253	0.16970	1.30977
	2	0.05658	0.3460	1.15805	1.11902	18		0.11133	0.5242	0.05893	1.31031
	3	0.05741	0.3576	1.15157	1.12792	19		0.11298	0.5211	0.90965	1.31071
h						h					
3.0)	4	0.05847	0.3685	1.14485	1.13652	(6.0)	20	0.11430	0.5171	0.68006	1.31098
	5	+0.05977	+0.3779	+1.13788	+1.14482	21		+0.11531	+0.5134	+0.16138	+1.31111
	6	0.06125	0.3851	1.13066	1.15284	22		0.11607	0.5110	-0.27601	1.31110
	7	0.06282	0.3894	1.12318	1.16059	23		0.11669	0.5104	0.971818	1.31095
	8	0.06437	0.3910	1.11543	1.16807	24		0.11728	0.5118	0.93263	1.31067
	9	0.06576	0.3901	1.10740	1.17530	25		0.11793	0.5148	0.07547	1.31024
	10	+0.06689	+0.3880	+1.09908	+1.18228	26		+0.11871	+0.5189	-0.18269	+1.30968
	11	0.06772	0.3861	1.09045	1.18902	27		0.11965	0.5236	0.26850	1.30899
	12	0.06830	0.3862	1.08152	1.19554	28		0.12079	0.5283	0.34002	1.30815
	13	0.06871	0.3896	1.07225	1.20182	29		0.12214	0.5322	0.40129	1.30717
	14	0.06915	0.3966	1.06264	1.20788	30		0.12364	0.5350	0.45486	1.30606
	15	+0.06980	+0.4069	+1.05267	+1.21373	31		+0.12527	+0.5360	-0.50242	+1.30480
	16	+0.07079	+0.4187	+1.04233	+1.21938	32		+0.12691	+0.5351	-0.54517	+1.30340

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	r	f	f'	G		H		Log g.	Log h.	i
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.			
	y	s	s	"	'	"	'			"
Jan. <										

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f		f'		G		H		Log g .	Log h .	i	Log i .
			In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	"	"	h	m	"	"	h	m	"	"
Feb.	15	0.1260	+1.520	-0.009	359 23.2	23 57.5	305 33.8	20 22.3	0.99303	1.28563	-6.81	-0.8332		
	16	0.1288	1.528	0.009	359 36.3	23 58.4	304 31.3	20 18.1	0.99512	1.28502	6.89	0.8382		
	17	0.1315	1.535	0.006	359 47.7	23 59.2	303 28.6	20 13.9	0.99800	1.28441	6.96	0.8429		
	18	0.1343	1.542	-0.001	359 54.3	23 59.6	302 25.7	20 9.7	1.00143	1.28380	7.04	0.8474		
	19	0.1370	1.549	+0.005	359 54.2	23 59.6	301 22.7	20 5.5	1.00512	1.28321	7.11	0.8518		
	h (10.0)	20	0.1397	+1.556	+0.010	359 47.3	23 59.2	300 19.6	20 1.3	1.00863	1.28263	-7.18	-0.8560	
		21	0.1425	1.563	0.014	359 35.2	23 58.4	299 16.3	19 57.1	1.01163	1.28206	7.24	0.8600	
		22	0.1452	1.570	0.015	359 20.4	23 57.4	298 12.9	19 52.9	1.01394	1.28150	7.31	0.8638	
		23	0.1480	1.577	0.014	359 5.6	23 56.4	297 9.4	19 48.6	1.01552	1.28097	7.37	0.8675	
		24	0.1507	1.584	0.011	358 53.0	23 55.5	296 5.8	19 44.4	1.01650	1.28044	7.43	0.8710	
25		0.1534	+1.590	+0.006	358 44.0	23 54.9	295 1.9	19 40.1	1.01703	1.27992	-7.49	-0.8744		
26		0.1562	1.597	+0.001	358 39.7	23 54.6	293 58.1	19 35.9	1.01729	1.27943	7.54	0.8775		
27		0.1589	1.603	-0.005	358 40.3	23 54.7	292 54.0	19 31.6	1.01752	1.27895	7.60	0.8806		
28		0.1616	1.610	0.010	358 45.0	23 55.0	291 49.9	19 27.3	1.01786	1.27850	7.65	0.8834		
Mar.		1	0.1644	1.616	0.014	358 53.4	23 55.6	290 45.7	19 23.0	1.01855	1.27804	7.69	0.8861	
h (11.0)	2	0.1671	+1.622	-0.016	359 3.8	23 56.3	289 41.4	19 18.8	1.01978	1.27762	-7.74	-0.8887		
	3	0.1699	1.629	0.015	359 14.6	23 57.0	288 37.0	19 14.5	1.02159	1.27721	7.78	0.8911		
	4	0.1726	1.635	0.012	359 23.5	23 57.6	287 32.5	19 10.2	1.02398	1.27683	7.82	0.8934		
	5	0.1753	1.641	0.008	359 28.4	23 57.9	286 27.9	19 5.9	1.02690	1.27647	7.86	0.8955		
	6	0.1781	1.647	-0.002	359 27.7	23 57.8	285 23.2	19 1.5	1.03006	1.27612	7.90	0.8975		
	7	0.1808	+1.653	+0.004	359 21.1	23 57.4	284 18.5	18 57.2	1.03315	1.27580	-7.93	-0.8994		
	8	0.1836	1.659	0.008	359 9.9	23 56.7	283 13.7	18 52.9	1.03584	1.27549	7.97	0.9012		
	9	0.1863	1.665	0.010	358 56.4	23 55.8	282 8.8	18 48.6	1.03787	1.27520	7.99	0.9026		
	10	0.1890	1.671	0.009	358 43.8	23 54.9	281 3.9	18 44.3	1.03910	1.27495	8.02	0.9041		
	11	0.1918	1.677	+0.005	358 35.6	23 54.4	279 58.9	18 39.9	1.03968	1.27472	8.04	0.9054		
h (12.0)	12	0.1945	+1.683	0.000	358 33.9	23 54.3	278 54.0	18 35.6	1.03987	1.27450	-8.06	-0.9065		
	13	0.1972	1.689	-0.005	358 39.6	23 54.6	277 49.0	18 31.3	1.04004	1.27431	8.08	0.9075		
	14	0.2000	1.694	0.009	358 51.8	23 55.5	276 43.9	18 26.9	1.04058	1.27416	8.10	0.9084		
	15	0.2027	1.700	0.010	359 7.5	23 56.5	275 38.9	18 22.6	1.04183	1.27402	8.11	0.9092		
	16	0.2054	1.706	0.008	359 23.3	23 57.6	274 33.9	18 18.3	1.04384	1.27390	8.13	0.9098		
	17	0.2082	+1.712	-0.003	359 35.7	23 58.4	273 28.9	18 13.9	1.04648	1.27380	-8.13	-0.9103		
	18	0.2109	1.717	+0.003	359 42.2	23 58.8	272 23.9	18 9.6	1.04945	1.27374	8.14	0.9106		
	19	0.2137	1.723	0.009	359 42.7	23 58.8	271 18.9	18 5.3	1.05241	1.27369	8.15	0.9108		
	20	0.2164	1.729	0.014	359 37.9	23 58.5	270 13.9	18 0.9	1.05497	1.27368	8.15	0.9109		
	21	0.2191	1.734	0.016	359 29.8	23 58.0	269 9.0	17 56.6	1.05697	1.27369	8.15	0.9109		
pr.	22	0.2219	+1.740	+0.016	359 20.9	23 57.4	268 4.2	17 52.3	1.05834	1.27371	-8.14	-0.9107		
	23	0.2246	1.746	0.013	359 13.6	23 56.9	266 59.4	17 48.0	1.05911	1.27378	8.14	0.9104		
	24	0.2274	1.752	0.009	359 9.3	23 56.6	265 54.6	17 43.6	1.05942	1.27385	8.13	0.9100		
	25	0.2301	1.758	+0.003	359 9.2	23 56.6	264 50.0	17 39.3	1.05948	1.27396	8.12	0.9095		
	26	0.2328	1.763	-0.003	359 13.3	23 56.9	263 45.4	17 35.0	1.05947	1.27409	8.11	0.9088		
	27	0.2356	+1.769	-0.008	359 21.8	23 57.5	262 40.9	17 30.7	1.05958	1.27424	-8.09	-0.9080		
	28	0.2383	1.775	0.012	359 33.6	23 58.2	261 36.4	17 26.4	1.05997	1.27442	8.07	0.9070		
	29	0.2410	1.780	0.015	359 47.8	23 59.2	260 32.0	17 22.1	1.06080	1.27462	8.05	0.9059		
	30	0.2438	1.786	0.015	0 2.6	0 0.2	259 27.8	17 17.9	1.06216	1.27483	8.03	0.9047		
	31	0.2465	1.792	0.013	0 16.2	0 1.1	258 23.7	17 13.6	1.06407	1.27507	8.01	0.9034		
pr.	1	0.2493	+1.798	-0.009	0 26.7	0 1.7	257 19.7	17 9.3	1.06650	1.27534	-7.98	-0.9019		
	2	0.2520	+1.804	-0.003	0 32.6	0 2.2	256 15.7	17 5.0	1.06923	1.27563	-7.95	-0.9003		

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	L
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	y	s	s	"	"	h	m	"	"			"	
Apr.	1	0.2493	+1.798	-0.009	0 26.7	0 1.7	257 19.7	17 9.3	1.06650	1.27534	-7.98	-0.	
	2	0.2520	1.804	-0.003	0 32.6	0 2.2	256 15.7	17 5.0	1.06923	1.27563	7.95	0.	
	3	0.2547	1.810	+0.002	0 33.0	0 2.2	255 11.9	17 0.8	1.07201	1.27593	7.92	0.	
	4	0.2575	1.816	0.007	0 28.7	0 1.9	254 8.2	16 56.5	1.07453	1.27626	7.88	0.	
h	5	0.2602	1.822	0.009	0 21.6	0 1.4	253 4.7	16 52.3	1.07648	1.27661	7.85	0.	
(13.0)	6	0.2630	+1.828	+0.008	0 14.4	0 1.0	252 1.3	16 48.1	1.07779	1.27698	-7.81	-0.	
	7	0.2657	1.834	+0.005	0 10.1	0 0.7	250 58.0	16 43.9	1.07851	1.27737	7.77	0.	
	8	0.2684	1.840	0.000	0 11.2	0 0.7	249 54.9	16 39.7	1.07879	1.27777	7.72	0.	
	9	0.2712	1.846	-0.005	0 19.1	0 1.3	248 51.9	16 35.5	1.07901	1.27819	7.68	0.	
	10	0.2739	1.853	0.009	0 33.2	0 2.2	247 49.1	16 31.3	1.07951	1.27864	7.63	0.	
	11	0.2766	+1.859	-0.011	0 51.3	0 3.4	246 46.4	16 27.1	1.08066	1.27910	-7.58	-0.	
	12	0.2794	1.865	0.009	1 10.3	0 4.7	245 43.9	16 22.9	1.08254	1.27957	7.53	0.	
	13	0.2821	1.872	-0.005	1 26.8	0 5.8	244 41.6	16 18.8	1.08510	1.28005	7.47	0.	
	14	0.2848	1.879	+0.001	1 38.5	0 6.6	243 39.5	16 14.6	1.08805	1.28056	7.42	0.	
	15	0.2876	1.885	0.007	1 44.4	0 7.0	242 37.6	16 10.5	1.09107	1.28107	7.36	0.	
	16	0.2903	+1.892	+0.013	1 44.9	0 7.0	241 35.8	16 6.4	1.09384	1.28160	-7.30	-0.	
	17	0.2931	1.898	0.016	1 41.8	0 6.8	240 34.3	16 2.3	1.09611	1.28215	7.24	0.	
	18	0.2958	1.905	0.017	1 37.2	0 6.5	239 32.9	15 58.2	1.09779	1.28270	7.17	0.	
	19	0.2985	1.912	0.015	1 33.5	0 6.2	238 31.7	15 54.1	1.09889	1.28326	7.10	0.	
	20	0.3013	1.919	0.011	1 32.4	0 6.2	237 30.8	15 50.1	1.09959	1.28383	7.03	0.	
h	21	0.3040	+1.926	+0.005	1 34.7	0 6.3	236 30.0	15 46.0	1.09999	1.28441	-6.96	-0.	
(14.0)	22	0.3068	1.933	0.000	1 41.1	0 6.7	235 29.4	15 42.0	1.10031	1.28500	6.89	0.	
	23	0.3095	1.940	-0.006	1 51.2	0 7.4	234 29.1	15 37.9	1.10076	1.28560	6.82	0.	
	24	0.3122	1.948	0.010	2 4.3	0 8.3	233 28.9	15 33.9	1.10143	1.28621	6.74	0.	
	25	0.3150	1.955	0.013	2 19.6	0 9.3	232 28.9	15 29.9	1.10249	1.28683	6.66	0.	
	26	0.3177	+1.962	-0.014	2 35.6	0 10.4	231 29.1	15 25.9	1.10406	1.28745	-6.58	-0.	
	27	0.3204	1.970	0.013	2 50.8	0 11.4	230 29.5	15 22.0	1.10611	1.28806	6.49	0.	
	28	0.3232	1.978	0.009	3 3.3	0 12.2	229 30.2	15 18.0	1.10862	1.28869	6.41	0.	
	29	0.3259	1.985	-0.004	3 11.8	0 12.8	228 31.0	15 14.1	1.11147	1.28932	6.33	0.	
	30	0.3287	1.993	+0.001	3 15.4	0 13.0	227 32.1	15 10.1	1.11438	1.28995	6.24	0.	
May	1	0.3314	+2.001	+0.006	3 14.5	0 13.0	226 33.3	15 6.2	1.11712	1.29059	-6.15	-0.	
	2	0.3341	2.009	0.009	3 10.3	0 12.7	225 34.7	15 2.3	1.11942	1.29122	6.06	0.	
	3	0.3369	2.017	0.009	3 5.2	0 12.3	224 36.3	14 58.4	1.12116	1.29185	5.96	0.	
	4	0.3396	2.025	0.006	3 1.9	0 12.1	223 38.2	14 54.5	1.12233	1.29249	5.87	0.	
	5	0.3424	2.033	+0.002	3 2.9	0 12.2	222 40.1	14 50.7	1.12308	1.29311	5.77	0.	
h	6	0.3451	+2.041	-0.004	3 9.4	0 12.6	221 42.3	14 46.8	1.12368	1.29374	-5.67	-0.	
(15.0)	7	0.3478	2.050	0.009	3 21.7	0 13.4	220 44.7	14 43.0	1.12449	1.29437	5.58	0.	
	8	0.3506	2.058	0.012	3 38.0	0 14.5	219 47.2	14 39.1	1.12583	1.29499	5.48	0.	
	9	0.3533	2.067	0.011	3 55.8	0 15.7	218 50.0	14 35.3	1.12786	1.29562	5.37	0.	
	10	0.3560	2.075	0.008	4 11.8	0 16.8	217 53.0	14 31.5	1.13054	1.29624	5.27	0.	
	11	0.3588	+2.084	-0.002	4 23.9	0 17.6	216 56.1	14 27.7	1.13365	1.29684	-5.16	-0.	
	12	0.3615	2.092	+0.004	4 30.4	0 18.0	215 59.4	14 24.0	1.13694	1.29745	5.06	0.	
	13	0.3642	2.101	0.010	4 31.7	0 18.1	215 2.9	14 20.2	1.14004	1.29804	4.95	0.	
	14	0.3670	2.111	0.015	4 29.3	0 18.0	214 6.6	14 16.4	1.14275	1.29863	4.84	0.	
	15	0.3697	2.120	0.016	4 24.9	0 17.7	213 10.5	14 12.7	1.14490	1.29921	4.73	0.	
	16	0.3725	+2.129	+0.015	4 20.8	0 17.4	212 14.5	14 9.0	1.14651	1.29979	-4.62	-0.	
	17	0.3752	2.138	+0.012	4 18.7	0 17.2	211 18.7	14 5.2	1.14767	1.30036	-4.50	-0.	

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	r	f		f'		G		H		Log g.	Log h.	i	Log i.
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	"	'	h	m	"	'	h	m	"	
May	17	0.3752	+2.138	+0.012	4 18.7	0 17.2	211 18.7	14 5.2	1.14767	1.30036	-4.50	-0.6534	
	18	0.3779	2.147	0.007	4 19.5	0 17.3	210 23.1	14 1.5	1.14856	1.30091	4.39	0.6422	
	19	0.3807	2.157	+0.002	4 23.7	0 17.6	209 27.7	13 57.8	1.14934	1.30146	4.27	0.6306	
	20	0.3834	2.166	-0.004	4 31.3	0 18.1	208 32.4	13 54.2	1.15017	1.30199	4.15	0.6185	
	21	0.3862	2.175	0.009	4 41.6	0 18.8	207 37.3	13 50.5	1.15123	1.30251	4.04	0.6059	
	h (16.0)	22	0.3889	+2.185	-0.012	4 53.6	0 19.6	206 42.3	13 46.8	1.15262	1.30302	-3.92	-0.5929
	23	0.3916	2.195	0.014	5 6.4	0 20.4	205 47.5	13 43.2	1.15439	1.30351	3.80	0.5794	
	24	0.3944	2.204	0.013	5 18.5	0 21.2	204 52.8	13 39.5	1.15601	1.30400	3.67	0.5652	
	25	0.3971	2.214	0.010	5 28.6	0 21.9	203 58.3	13 35.9	1.15923	1.30447	3.55	0.5506	
	26	0.3998	2.224	-0.005	5 35.3	0 22.4	203 3.9	13 32.3	1.16215	1.30493	3.43	0.5352	
	27	0.4026	+2.234	0.000	5 37.8	0 22.5	202 9.6	13 28.6	1.16516	1.30538	-3.31	-0.5192	
	28	0.4053	2.244	+0.005	5 36.0	0 22.4	201 15.4	13 25.0	1.16808	1.30581	3.18	0.5024	
	29	0.4081	2.254	0.009	5 30.8	0 22.1	200 21.4	13 21.4	1.17065	1.30623	3.05	0.4849	
	30	0.4108	2.264	0.010	5 24.1	0 21.6	199 27.5	13 17.8	1.17270	1.30663	2.93	0.4665	
	31	0.4135	2.274	0.008	5 18.4	0 21.2	198 33.7	13 14.2	1.17422	1.30702	2.80	0.4472	
	June	1	0.4163	+2.284	+0.004	5 15.7	0 21.0	197 40.0	13 10.7	1.17532	1.30739	-2.67	-0.4268
	2	0.4190	2.294	-0.002	5 17.8	0 21.2	196 46.4	13 7.1	1.17618	1.30774	2.54	0.4053	
	3	0.4218	2.305	0.007	5 24.8	0 21.6	195 52.9	13 3.5	1.17716	1.30809	2.41	0.3825	
	4	0.4245	2.315	0.011	5 35.8	0 22.4	194 59.5	13 0.0	1.17852	1.30840	2.28	0.3584	
	h (17.0)	5	0.4272	2.326	0.012	5 48.6	0 23.2	194 6.2	12 56.4	1.18043	1.30871	2.15	0.3328
	6	0.4300	+2.336	-0.010	6 0.7	0 24.0	193 12.9	12 52.9	1.18295	1.30900	-2.02	-0.3054	
	7	0.4327	2.346	-0.005	6 9.6	0 24.6	192 19.8	12 49.3	1.18592	1.30926	1.89	0.2760	
	8	0.4354	2.357	+0.001	6 13.9	0 24.9	191 26.7	12 45.8	1.18912	1.30951	1.76	0.2444	
	9	0.4382	2.367	0.008	6 13.3	0 24.9	190 33.7	12 42.2	1.19225	1.30975	1.62	0.2102	
	10	0.4409	2.378	0.013	6 8.8	0 24.5	189 40.7	12 38.7	1.19504	1.30996	1.49	0.1729	
	11	0.4436	+2.388	+0.016	6 2.2	0 24.1	188 47.8	12 35.2	1.19736	1.31016	-1.36	-0.1320	
	12	0.4464	2.399	0.016	5 55.2	0 23.7	187 55.0	12 31.7	1.19919	1.31034	1.22	0.0867	
	13	0.4491	2.410	0.013	5 49.6	0 23.3	187 2.3	12 28.2	1.20059	1.31051	1.09	0.0360	
	14	0.4519	2.420	0.009	5 46.4	0 23.1	186 9.6	12 24.6	1.20164	1.31065	0.95	9.9785	
	15	0.4546	2.431	+0.003	5 46.1	0 23.1	185 16.9	12 21.1	1.20256	1.31077	0.82	9.9121	
	16	0.4573	+2.442	-0.002	5 48.9	0 23.3	184 24.3	12 17.6	1.20351	1.31087	-0.68	-9.8335	
	17	0.4601	2.452	0.008	5 54.2	0 23.6	183 31.7	12 14.1	1.20459	1.31097	0.55	9.7374	
	18	0.4628	2.463	0.011	6 1.2	0 24.1	182 39.1	12 10.6	1.20589	1.31103	0.41	9.6136	
	19	0.4656	2.474	0.013	6 9.1	0 24.6	181 46.6	12 7.1	1.20752	1.31108	0.28	9.4397	
	h (18.0)	20	0.4683	2.484	0.013	6 16.7	0 25.1	180 54.1	12 3.6	1.20953	1.31110	-0.14	9.1451
	21	0.4710	+2.495	-0.011	6 22.7	0 25.5	180 1.6	12 0.1	1.21188	1.31112	0.00	-7.6077	
	22	0.4738	2.506	0.007	6 26.2	0 25.7	179 9.1	11 56.6	1.21453	1.31111	+0.13	+9.1190	
	23	0.4765	2.517	-0.002	6 26.1	0 25.7	178 16.6	11 53.1	1.21730	1.31108	0.27	9.4266	
	24	0.4792	2.527	+0.004	6 22.1	0 25.5	177 24.1	11 49.6	1.22004	1.31104	0.40	9.6048	
	25	0.4820	2.538	0.008	6 15.0	0 25.0	176 31.6	11 46.1	1.22254	1.31097	0.54	9.7306	
	26	0.4847	+2.549	+0.010	6 6.1	0 24.4	175 39.1	11 42.6	1.22460	1.31088	+0.67	+9.8280	
	27	0.4875	2.559	0.010	5 57.3	0 23.8	174 46.5	11 39.1	1.22616	1.31078	0.81	9.9074	
	28	0.4902	2.570	0.006	5 50.5	0 23.4	173 53.9	11 35.6	1.22730	1.31066	0.94	9.9744	
	29	0.4929	2.581	+0.001	5 47.5	0 23.2	173 1.3	11 32.1	1.22816	1.31052	1.08	0.0323	
	30	0.4957	2.591	-0.005	5 49.0	0 23.3	172 8.7	11 28.6	1.22897	1.31036	1.21	0.0833	
	July	1	0.4984	+2.602	-0.010	5 54.5	0 23.6	171 16.0	11 25.1	1.23002	1.31017	+1.35	+0.1288
	2	0.5012	+2.612	-0.012	6 2.3	0 24.2	170 23.3	11 21.6	1.23153	1.30998	+1.48	+0.1699	

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	Log i .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
July	y	s	s	s	s	'	h m	'	h m			"	
	1	0.4984	+2.602	-0.010	5 54.5	0 23.6	171 16.0	11 25.1	1.23002	1.31017	+1.35	+0.1288	
	2	0.5012	2.612	0.012	6 2.3	0 24.2	170 23.3	11 21.6	1.23153	1.30998	1.48	0.1699	
	3	0.5039	2.623	0.011	6 10.1	0 24.4	169 30.5	11 18.0	1.23353	1.30976	1.61	0.2073	
	4	0.5066	2.633	0.007	6 15.9	0 25.0	168 37.6	11 14.5	1.23599	1.30953	1.74	0.2417	
	5	0.5094	2.644	-0.001	6 18.2	0 25.2	167 44.7	11 11.0	1.23872	1.30928	1.88	0.2734	
	h	6	0.5121	+2.654	+0.005	6 16.1	0 25.1	166 51.7	11 7.4	1.24147	1.30902	+2.01	+0.3029
	(19.0)	7	0.5148	2.665	0.011	6 9.9	0 24.7	165 58.7	11 3.9	1.24399	1.30874	2.14	0.3303
	8	0.5176	2.675	0.014	6 1.4	0 24.1	165 5.6	11 0.4	1.24611	1.30843	2.27	0.3560	
	9	0.5203	2.685	0.015	5 52.0	0 23.5	164 12.4	10 56.8	1.24781	1.30812	2.40	0.3802	
	10	0.5230	2.696	0.014	5 43.4	0 22.9	163 19.1	10 53.3	1.24908	1.30778	2.53	0.4030	
	11	0.5258	+2.706	+0.010	5 36.9	0 22.5	162 25.7	10 49.7	1.25000	1.30742	+2.66	+0.4246	
	12	0.5285	2.716	+0.005	5 33.1	0 22.2	161 32.3	10 46.2	1.25075	1.30706	2.79	0.4449	
	13	0.5313	2.726	-0.001	5 32.0	0 22.1	160 38.7	10 42.6	1.25142	1.30668	2.91	0.4643	
	14	0.5340	2.736	0.006	5 33.3	0 22.2	159 45.1	10 39.0	1.25220	1.30628	3.04	0.4827	
	15	0.5367	2.746	0.011	5 36.3	0 22.4	158 51.3	10 35.4	1.25315	1.30586	3.16	0.5003	
h	16	0.5395	+2.756	-0.013	5 40.6	0 22.7	157 57.5	10 31.8	1.25437	1.30543	+3.29	+0.5171	
	17	0.5422	2.766	0.014	5 44.9	0 23.0	157 3.5	10 28.2	1.25586	1.30499	3.41	0.5331	
	18	0.5450	2.776	0.012	5 48.4	0 23.2	156 9.4	10 24.6	1.25767	1.30455	3.54	0.5484	
	19	0.5477	2.785	0.009	5 49.9	0 23.3	155 15.2	10 21.0	1.25977	1.30408	3.66	0.5631	
	20	0.5504	2.795	-0.004	5 48.6	0 23.2	154 20.9	10 17.4	1.26205	1.30360	3.78	0.5772	
	h	21	0.5532	+2.805	+0.002	5 43.9	0 22.9	153 26.5	10 13.8	1.26436	1.30310	+3.90	+0.5908
	(20.0)	22	0.5559	2.814	0.007	5 36.3	0 22.4	152 31.9	10 10.1	1.26651	1.30260	4.02	0.6038
	23	0.5586	2.824	0.010	5 26.6	0 21.8	151 37.2	10 6.5	1.26832	1.30208	4.14	0.6163	
	24	0.5614	2.833	0.010	5 16.3	0 21.1	150 42.3	10 2.8	1.26969	1.30155	4.25	0.6284	
	25	0.5641	2.842	0.008	5 7.3	0 20.5	149 47.3	9 59.2	1.27067	1.30101	4.37	0.6400	
	26	0.5669	+2.851	+0.003	5 1.3	0 20.1	148 52.1	9 55.5	1.27132	1.30046	+4.48	+0.6512	
	27	0.5696	2.861	-0.002	4 59.2	0 19.9	147 56.8	9 51.8	1.27183	1.29990	4.59	0.6620	
	28	0.5723	2.870	0.007	5 1.1	0 20.1	147 1.4	9 48.1	1.27245	1.29933	4.70	0.6724	
	29	0.5751	2.879	0.010	5 5.9	0 20.4	146 5.7	9 44.4	1.27339	1.29876	4.81	0.6825	
	30	0.5778	2.888	0.011	5 11.7	0 20.8	145 9.9	9 40.7	1.27478	1.29818	4.92	0.6922	
	Aug.	31	0.5806	+2.896	-0.008	5 16.4	0 21.1	144 13.9	9 36.9	1.27660	1.29759	+5.03	+0.7016
1		0.5833	2.905	-0.003	5 18.3	0 21.2	143 17.8	9 33.2	1.27870	1.29699	5.14	0.7107	
2		0.5860	2.914	+0.004	5 16.3	0 21.1	142 21.4	9 29.4	1.28091	1.29639	5.24	0.7195	
3		0.5888	2.922	0.010	5 10.6	0 20.7	141 24.9	9 25.7	1.28301	1.29578	5.35	0.7280	
4		0.5915	2.931	0.014	5 2.2	0 20.1	140 28.3	9 21.9	1.28479	1.29517	5.45	0.7362	
h		5	0.5942	+2.939	+0.015	4 52.6	0 19.5	139 31.4	9 18.1	1.28617	1.29456	+5.55	+0.7441
(21.0)		6	0.5970	2.948	0.014	4 43.3	0 18.9	138 34.4	9 14.3	1.28714	1.29394	5.65	0.7518
7		0.5997	2.956	0.011	4 35.7	0 18.4	137 37.2	9 10.5	1.28778	1.29331	5.74	0.7593	
8		0.6024	2.964	0.006	4 30.4	0 18.0	136 39.8	9 6.7	1.28819	1.29268	5.84	0.7664	
9		0.6052	2.972	+0.001	4 27.7	0 17.8	135 42.2	9 2.8	1.28853	1.29205	5.93	0.7734	
10		0.6079	+2.980	-0.005	4 27.5	0 17.8	134 44.5	8 59.0	1.28889	1.29142	+6.03	+0.7801	
11		0.6107	2.988	0.010	4 29.3	0 18.0	133 46.5	8 55.1	1.28938	1.29079	6.11	0.7866	
12		0.6134	2.996	0.013	4 32.3	0 18.2	132 48.4	8 51.2	1.29009	1.29017	6.21	0.7929	
13		0.6161	3.004	0.014	4 35.9	0 18.4	131 50.1	8 47.3	1.29104	1.28954	6.30	0.7990	
14		0.6189	3.011	0.014	4 39.0	0 18.6	130 51.6	8 43.4	1.29228	1.28891	6.38	0.8049	
15		0.6216	+3.019	-0.011	4 40.8	0 18.7	129 52.9	8 39.5	1.29380	1.28830	+6.47	+0.8106	
16	0.6244	+3.026	-0.006	4 40.4	0 18.7	128 54.0	8 35.6	1.29549	1.28767	+6.55	+0.8160		

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	r	f	f'	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	s	h m	s	h m			"	
Aug. 16	0.6244	+3.026	-0.006	4 40.4	0 18.7	128 54.0	8 35.6	1.29549	1.28767	+6.55	+0.8160
17	0.6271	3.034	-0.001	4 37.2	0 18.5	127 55.0	8 31.7	1.29727	1.28708	6.63	0.8214
18	0.6298	3.041	+0.004	4 31.2	0 18.1	126 55.8	8 27.7	1.29901	1.28646	6.71	0.8265
19	0.6326	3.048	0.008	4 22.9	0 17.5	125 56.3	8 23.8	1.30052	1.28586	6.78	0.8314
h (22.0)	0.6353	3.055	0.009	4 13.6	0 16.9	124 56.7	8 19.8	1.30166	1.28526	6.86	0.8362
21	0.6380	+3.062	+0.008	4 4.9	0 16.3	123 57.0	8 15.8	1.30240	1.28468	+6.93	+0.8408
22	0.6408	3.069	+0.005	3 58.6	0 15.9	122 57.0	8 11.8	1.30282	1.28410	7.00	0.8452
23	0.6435	3.076	0.000	3 55.7	0 15.7	121 56.8	8 7.8	1.30305	1.28352	7.07	0.8495
24	0.6463	3.083	-0.006	3 56.6	0 15.8	120 56.5	8 3.8	1.30330	1.28297	7.14	0.8536
25	0.6490	3.090	0.009	4 0.8	0 16.1	119 56.0	7 59.7	1.30378	1.28242	7.20	0.8575
26	0.6517	+3.096	-0.010	4 6.6	0 16.4	118 55.2	7 55.7	1.30461	1.28187	+7.27	+0.8613
27	0.6545	3.103	0.008	4 12.4	0 16.8	117 54.3	7 51.6	1.30589	1.28134	7.33	0.8649
28	0.6572	3.110	-0.004	4 16.1	0 17.1	116 53.3	7 47.6	1.30749	1.28083	7.39	0.8684
29	0.6600	3.116	+0.002	4 16.5	0 17.1	115 52.0	7 43.5	1.30924	1.28033	7.44	0.8717
30	0.6627	3.122	0.009	4 13.5	0 16.9	114 50.5	7 39.4	1.31098	1.27984	7.50	0.8749
Sept. 1	0.6654	+3.129	+0.013	4 7.6	0 16.5	113 49.0	7 35.3	1.31246	1.27936	+7.55	+0.8780
h (23.0)	0.6682	3.135	0.016	4 0.0	0 16.0	112 47.2	7 31.1	1.31360	1.27890	7.60	0.8809
2	0.6709	3.141	0.016	3 52.3	0 15.5	111 45.3	7 27.0	1.31435	1.27845	7.65	0.8836
3	0.6736	3.148	0.013	3 45.7	0 15.0	110 43.2	7 22.9	1.31476	1.27803	7.69	0.8862
4	0.6764	3.154	0.008	3 41.3	0 14.7	109 41.0	7 18.7	1.31493	1.27762	7.74	0.8887
h (23.0)	0.6791	+3.160	+0.003	3 39.3	0 14.6	108 38.6	7 14.6	1.31497	1.27722	+7.78	+0.8911
6	0.6818	3.166	-0.003	3 40.0	0 14.7	107 36.1	7 10.4	1.31503	1.27684	7.82	0.8933
7	0.6846	3.172	0.008	3 42.7	0 14.8	106 33.4	7 6.2	1.31520	1.27649	7.86	0.8954
8	0.6873	3.177	0.012	3 46.9	0 15.1	105 30.6	7 2.0	1.31555	1.27615	7.89	0.8973
9	0.6901	3.183	0.014	3 51.9	0 15.4	104 27.7	6 57.8	1.31611	1.27583	7.93	0.8991
10	0.6928	+3.189	-0.014	3 56.9	0 15.8	103 24.7	6 53.6	1.31695	1.27554	+7.96	+0.9008
11	0.6955	3.195	0.012	4 0.9	0 16.1	102 21.6	6 49.4	1.31805	1.27527	7.99	0.9023
12	0.6983	3.201	0.008	4 3.3	0 16.2	101 18.3	6 45.2	1.31936	1.27501	8.01	0.9038
13	0.7010	3.206	-0.003	4 3.3	0 16.2	100 14.9	6 41.0	1.32078	1.27478	8.04	0.9050
14	0.7038	3.212	+0.002	4 0.5	0 16.0	99 11.5	6 36.8	1.32221	1.27456	8.06	0.9062
15	0.7065	+3.218	+0.006	3 55.4	0 15.7	98 8.0	6 32.5	1.32348	1.27437	+8.08	+0.9072
16	0.7092	3.223	0.008	3 49.1	0 15.3	97 4.4	6 28.3	1.32446	1.27420	8.09	0.9081
17	0.7120	3.229	0.008	3 42.8	0 14.8	96 0.7	6 24.0	1.32512	1.27406	8.11	0.9089
18	0.7147	3.234	+0.005	3 38.1	0 14.5	94 57.0	6 19.8	1.32546	1.27393	8.12	0.9096
19	0.7174	3.240	0.000	3 36.4	0 14.4	93 53.1	6 15.5	1.32556	1.27384	8.13	0.9101
h (0.0)	0.7202	+3.246	-0.005	3 38.3	0 14.6	92 49.2	6 11.3	1.32564	1.27376	+8.14	+0.9105
21	0.7229	3.251	0.009	3 43.7	0 14.9	91 45.3	6 7.0	1.32588	1.27371	8.14	0.9108
22	0.7256	3.257	0.011	3 51.3	0 15.4	90 41.3	6 2.8	1.32645	1.27368	8.15	0.9109
23	0.7284	3.262	0.009	3 59.5	0 16.0	89 37.3	5 58.5	1.32744	1.27368	8.15	0.9109
24	0.7311	3.268	-0.005	4 6.2	0 16.4	88 33.2	5 54.2	1.32878	1.27370	8.14	0.9108
25	0.7339	+3.273	+0.001	4 10.3	0 16.7	87 29.1	5 49.9	1.33035	1.27375	+8.14	+0.9106
26	0.7366	3.279	0.007	4 11.0	0 16.7	86 25.0	5 45.7	1.33197	1.27381	8.13	0.9102
27	0.7393	3.284	0.013	4 8.7	0 16.5	85 20.8	5 41.4	1.33340	1.27390	8.12	0.9097
28	0.7421	3.290	0.016	4 4.5	0 16.3	84 16.7	5 37.1	1.33454	1.27402	8.11	0.9091
29	0.7448	3.295	0.017	3 59.5	0 16.0	83 12.5	5 32.8	1.33531	1.27416	8.10	0.9084
30	0.7476	+3.301	+0.015	3 55.4	0 15.7	82 8.4	5 28.6	1.33573	1.27432	+8.08	+0.9075
Oct. 1	0.7503	+3.306	+0.010	3 53.1	0 15.5	81 4.2	5 24.3	1.33590	1.27452	+8.06	+0.9065

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	Log i .
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.				
		s		s		$^{\circ}$ $'$	$^{\circ}$ $'$	$^{\circ}$ $'$	$^{\circ}$ $'$			$''$	
Oct.	1	0.7503	+3.306	+0.010		3 53.1	0 15.5	81 4.2	5 24.3	1.33590	1.27452	+8.06	+0.9065
	2	0.7530	3.312	+0.005		3 53.2	0 15.5	80 0.1	5 20.0	1.33592	1.27472	8.04	0.9053
	3	0.7558	3.318	-0.001		3 55.8	0 15.7	78 56.0	5 15.7	1.33592	1.27495	8.02	0.9040
	4	0.7585	3.323	0.006		4 0.5	0 16.0	77 52.0	5 11.5	1.33602	1.27520	7.99	0.9026
	5	0.7612	3.329	0.010		4 6.8	0 16.5	76 48.0	5 7.2	1.33629	1.27548	7.96	0.9011
h (1.0)	6	0.7640	+3.335	-0.013		4 14.1	0 16.9	75 44.0	5 2.9	1.33679	1.27578	+7.93	+0.8994
	7	0.7667	3.341	0.013		4 21.5	0 17.4	74 40.1	4 58.7	1.33753	1.27610	7.90	0.8976
	8	0.7695	3.347	0.012		4 28.2	0 17.9	73 36.2	4 54.4	1.33852	1.27644	7.86	0.8957
	9	0.7722	3.352	0.009		4 33.6	0 18.2	72 32.4	4 50.2	1.33975	1.27678	7.83	0.8936
	10	0.7749	3.358	-0.005		4 36.8	0 18.5	71 28.7	4 45.9	1.34111	1.27718	7.79	0.8913
	11	0.7777	+3.364	0.000		4 37.6	0 18.5	70 25.0	4 41.7	1.34252	1.27758	+7.75	+0.8889
	12	0.7804	3.370	+0.004		4 36.0	0 18.4	69 21.5	4 37.4	1.34383	1.27800	7.70	0.8864
	13	0.7832	3.376	0.007		4 32.9	0 18.2	68 18.1	4 33.2	1.34493	1.27843	7.65	0.8838
	14	0.7859	3.383	0.007		4 29.2	0 17.9	67 14.8	4 29.0	1.34572	1.27888	7.60	0.8810
	15	0.7886	3.389	0.005		4 26.5	0 17.8	66 11.5	4 24.8	1.34618	1.27935	7.55	0.8780
	16	0.7914	+3.395	+0.001		4 26.5	0 17.7	65 8.4	4 20.6	1.34643	1.27984	+7.50	+0.8749
	17	0.7941	3.402	-0.004		4 29.6	0 18.0	64 5.4	4 16.4	1.34662	1.28035	7.44	0.8716
	18	0.7968	3.408	0.009		4 36.1	0 18.4	63 2.4	4 12.2	1.34692	1.28087	7.38	0.8682
	19	0.7996	3.414	0.012		4 45.1	0 19.0	61 59.6	4 8.0	1.34752	1.28140	7.32	0.8646
h (2.0)	20	0.8023	3.421	0.011		4 55.0	0 19.7	60 57.0	4 3.8	1.34851	1.28194	7.26	0.8608
	21	0.8050	+3.428	-0.008		5 4.2	0 20.3	59 54.4	3 59.6	1.34990	1.28250	+7.19	+0.8569
	22	0.8078	3.434	-0.002		5 11.1	0 20.7	58 52.0	3 55.5	1.35157	1.28307	7.13	0.8528
	23	0.8105	3.441	+0.005		5 14.8	0 21.0	57 49.7	3 51.3	1.35335	1.28365	7.06	0.8485
	24	0.8133	3.448	0.011		5 15.3	0 21.0	56 47.5	3 47.2	1.35499	1.28425	6.98	0.8440
	25	0.8160	3.455	0.016		5 13.6	0 20.9	55 45.5	3 43.0	1.35641	1.28485	6.91	0.8394
	26	0.8187	+3.462	+0.017		5 10.8	0 20.7	54 43.6	3 38.9	1.35748	1.28546	+6.83	+0.8346
	27	0.8215	3.469	0.016		5 8.3	0 20.6	53 41.8	3 34.8	1.35818	1.28608	6.75	0.8296
	28	0.8242	3.476	0.013		5 7.4	0 20.5	52 40.2	3 30.7	1.35863	1.28671	6.67	0.8244
	29	0.8270	3.484	0.007		5 8.5	0 20.6	51 38.7	3 26.6	1.35891	1.28734	6.59	0.8190
	30	0.8297	3.491	+0.002		5 12.0	0 20.8	50 37.4	3 22.5	1.35915	1.28799	6.51	0.8134
	31	0.8324	+3.499	-0.004		5 17.6	0 21.2	49 36.2	3 18.4	1.35948	1.28863	+6.42	+0.8076
Nov.	1	0.8352	3.506	0.008		5 24.7	0 21.6	48 35.2	3 14.3	1.35994	1.28928	6.33	0.8016
	2	0.8379	3.514	0.011		5 32.9	0 22.2	47 34.3	3 10.3	1.36063	1.28992	6.24	0.7953
	3	0.8406	3.522	0.012		5 41.3	0 22.8	46 33.6	3 6.2	1.36156	1.29058	6.15	0.7888
h (3.0)	4	0.8434	3.530	0.012		5 49.0	0 23.3	45 33.0	3 2.2	1.36272	1.29124	6.05	0.7821
	5	0.8461	+3.538	-0.009		5 55.5	0 23.7	44 32.5	2 58.2	1.36411	1.29189	+5.96	+0.7751
	6	0.8489	3.546	0.005		6 0.2	0 24.0	43 32.2	2 54.1	1.36565	1.29254	5.86	0.7679
	7	0.8516	3.554	-0.001		6 2.4	0 24.2	42 32.1	2 50.1	1.36725	1.29320	5.76	0.7604
	8	0.8543	3.562	+0.004		6 2.5	0 24.2	41 32.2	2 46.1	1.36880	1.29386	5.66	0.7527
	9	0.8571	3.571	0.007		6 0.6	0 24.0	40 32.4	2 42.2	1.37017	1.29450	5.55	0.7447
	10	0.8598	+3.579	+0.008		5 57.9	0 24.0	39 32.7	2 38.2	1.37126	1.29516	+5.45	+0.7363
	11	0.8626	3.588	0.006		5 55.7	0 23.7	38 33.2	2 34.2	1.37206	1.29580	5.34	0.7277
	12	0.8653	3.596	+0.002		5 55.3	0 23.7	37 33.8	2 30.3	1.37263	1.29644	5.23	0.7188
	13	0.8680	3.605	-0.003		5 57.7	0 23.8	36 34.6	2 26.3	1.37308	1.29707	5.12	0.7095
	14	0.8708	3.614	0.008		6 3.2	0 24.2	35 35.6	2 22.4	1.37360	1.29770	5.01	0.6999
	15	0.8735	+3.623	-0.012		6 11.3	0 24.7	34 36.7	2 18.4	1.37434	1.29832	+4.90	+0.6899
	16	0.8762	+3.632	-0.013		6 20.5	0 25.4	33 37.9	2 14.5	1.37546	1.29893	+4.78	+0.6796

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	Log i .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	γ	s	s	s	h	m	s	h	m			$''$	
Nov.	16	0.8762	+3.632	-0.013	6	20.5	0 25.4	33	37.9	1.37546	1.29893	+4.78	+0.6796
	17	0.8790	3.641	0.010	6	29.6	0 26.0	32	39.3	1.37699	1.29954	4.66	0.6688
	18	0.8817	3.650	-0.005	6	36.6	0 26.4	31	40.8	1.37882	1.30013	4.55	0.6577
	19	0.8844	3.660	+0.002	6	40.7	0 26.7	30	42.4	1.38079	1.30072	4.43	0.6461
h	20	0.8872	3.669	0.008	6	41.7	0 26.8	29	44.2	1.38274	1.30129	4.31	0.6340
4.0)	21	0.8899	+3.679	+0.014	6	40.2	0 26.7	28	46.1	1.38447	1.30185	+4.18	+0.6215
	22	0.8927	3.688	0.017	6	37.2	0 26.5	27	48.2	1.38590	1.30240	4.06	0.6084
	23	0.8954	3.698	0.017	6	34.1	0 26.3	26	50.3	1.38699	1.30295	3.93	0.5948
	24	0.8981	3.708	0.014	6	32.0	0 26.1	25	52.6	1.38778	1.30348	3.81	0.5806
	25	0.9009	3.718	0.009	6	31.9	0 26.1	24	54.9	1.38839	1.30398	3.68	0.5658
	26	0.9036	+3.728	+0.004	6	33.8	0 26.3	23	57.4	1.38892	1.30448	+3.55	+0.5503
	27	0.9064	3.738	-0.002	6	37.7	0 26.5	23	0.0	1.38949	1.30496	3.42	0.5341
	28	0.9091	3.748	0.007	6	43.1	0 26.9	22	2.7	1.39017	1.30544	3.29	0.5171
	29	0.9118	3.758	0.010	6	49.4	0 27.3	21	5.5	1.39106	1.30590	3.16	0.4993
	30	0.9146	3.768	0.012	6	56.0	0 27.7	20	8.4	1.39216	1.30633	3.02	0.4805
Dec.	1	0.9173	+3.778	-0.012	7	2.2	0 28.1	19	11.4	1.39347	1.30675	+2.89	+0.4608
	2	0.9200	3.789	0.010	7	7.3	0 28.5	18	14.4	1.39497	1.30715	2.75	0.4400
	3	0.9228	3.799	0.006	7	10.7	0 28.7	17	17.6	1.39665	1.30754	2.62	0.4179
	4	0.9255	3.810	-0.001	7	11.9	0 28.8	16	20.8	1.39838	1.30790	2.48	0.3946
h	5	0.9283	3.820	+0.003	7	11.0	0 28.7	15	24.1	1.40011	1.30825	2.34	0.3697
5.0)	6	0.9310	+3.831	+0.007	7	8.1	0 28.5	14	27.5	1.40166	1.30859	+2.20	+0.3432
	7	0.9337	3.842	0.008	7	4.2	0 28.3	13	31.0	1.40298	1.30890	2.06	0.3149
	8	0.9365	3.852	0.008	7	0.2	0 28.0	12	34.5	1.40404	1.30919	1.93	0.2844
	9	0.9392	3.863	+0.004	6	57.5	0 27.8	11	38.1	1.40482	1.30945	1.78	0.2514
	10	0.9420	3.874	-0.001	6	57.0	0 27.8	10	41.8	1.40544	1.30971	1.64	0.2156
	11	0.9447	+3.885	-0.007	6	59.3	0 28.0	9	45.5	1.40608	1.30995	+1.50	+0.1763
	12	0.9474	3.896	0.011	7	4.2	0 28.3	8	49.2	1.40686	1.31015	1.36	0.1331
	13	0.9502	3.907	0.013	7	10.6	0 28.7	7	53.0	1.40795	1.31035	1.22	0.0849
	14	0.9529	3.918	0.012	7	17.0	0 29.1	6	56.9	1.40940	1.31052	1.07	0.0304
	15	0.9556	3.928	0.008	7	22.2	0 29.5	6	0.8	1.41116	1.31067	0.93	9.9681
	16	0.9584	+3.939	-0.002	7	24.7	0 29.6	5	4.7	1.41311	1.31080	+0.79	+9.9550
	17	0.9611	3.950	+0.005	7	24.4	0 29.6	4	8.6	1.41510	1.31091	0.64	9.8070
	18	0.9638	3.962	0.011	7	21.3	0 29.4	3	12.5	1.41693	1.31099	0.50	9.6962
	19	0.9666	3.973	0.016	7	16.5	0 29.1	2	16.5	1.41850	1.31104	0.35	9.5469
h	20	0.9693	3.984	0.016	7	11.3	0 28.8	1	20.4	1.41973	1.31110	0.21	9.3173
6.0)	21	0.9721	+3.995	+0.015	7	6.6	0 28.4	0	24.4	1.42067	1.31112	+0.06	+8.7986
	22	0.9748	4.006	0.011	7	3.6	0 28.2	359	28.3	1.42139	1.31112	-0.08	-8.9133
	23	0.9775	4.017	+0.005	7	2.4	0 28.2	358	32.2	1.42199	1.31109	0.23	9.3554
	24	0.9803	4.028	0.000	7	3.2	0 28.2	357	36.1	1.42259	1.31105	0.37	9.5699
	25	0.9830	4.039	-0.005	7	5.5	0 28.4	356	40.0	1.42327	1.31098	0.52	9.7127
	26	0.9858	+4.050	-0.009	7	8.8	0 28.6	355	43.9	1.42411	1.31089	-0.66	-9.8200
	27	0.9885	4.061	0.011	7	12.5	0 28.8	354	47.7	1.42511	1.31078	0.80	9.9058
	28	0.9912	4.072	0.012	7	16.0	0 29.0	353	51.5	1.42629	1.31065	0.95	9.9773
	29	0.9940	4.083	0.010	7	18.5	0 29.2	352	55.2	1.42769	1.31050	1.09	0.0386
	30	0.9967	4.094	0.007	7	19.8	0 29.3	351	58.9	1.42921	1.31032	1.24	0.0921
	31	0.9994	+4.105	-0.003	7	19.2	0 29.3	351	2.5	1.43083	1.31013	-1.38	-0.1387
	32	1.0022	+4.116	+0.002	7	16.6	0 29.1	350	6.1	1.43243	1.30992	-1.52	-0.1527

214 BESSELIAN AND INDEPENDENT STAR-NUMBERS, 1918.

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A ₁ .	Log B ₁ .	Log C.	Log D.	f	G ₁	H	Log g ₁ .	Log h.	Log i.
					s	°	'			
Jan. 0.72	+9.5459	+9.4442	-0.5229	+1.3042	+1.083	2 16	350 36	0.8481	1.3100	-0.1601
10.69	9.5879	9.4227	0.8157	1.2830	1.192	1 57	341 10	0.8901	1.3069	0.4530
20.67	9.6240	9.2956	0.9798	1.2462	1.296	1 20	331 34	0.9261	1.3020	0.6170
30.64	9.6547	+8.9872	1.0878	1.1910	1.390	0 37	321 45	0.9567	1.2960	0.7251
Feb. 9.61	9.6804	-8.1584	1.1628	1.1120	1.475	359 55	311 39	0.9824	1.2894	0.8001
19.59	+9.7020	-9.0488	-1.2149	+0.9986	+1.550	359 22	301 17	1.0040	1.2832	-0.8522
Mar. 1.56	9.7203	9.2398	1.2490	0.8263	1.616	359 3	290 42	1.0224	1.2780	0.8863
11.53	9.7363	9.2608	1.2681	+0.5122	1.677	359 3	279 57	1.0384	1.2747	0.9054
21.50	9.7510	9.1069	1.2736	-9.4446	1.734	359 21	269 9	1.0530	1.2737	0.9109
31.48	9.7652	-7.8692	1.2661	0.5778	1.792	359 58	258 25	1.0672	1.2751	0.9034
Apr. 10.45	+9.7796	+9.2370	-1.2454	-0.8546	+1.852	0 49	247 52	1.0816	1.2786	-0.8827
20.42	9.7949	9.6024	1.2103	1.0129	1.918	1 50	237 36	1.0971	1.2838	0.8476
30.39	9.8113	9.8187	1.1584	1.1185	1.992	2 54	227 38	1.1139	1.2899	0.7957
May 10.37	9.8288	9.9670	1.0856	1.1926	2.074	3 56	218 0	1.1318	1.2962	0.7229
20.34	9.8473	0.0736	0.9832	1.2450	2.165	4 48	208 41	1.1508	1.3019	0.6204
30.31	+9.8665	+0.1502	-0.8328	-1.2806	+2.262	5 29	199 38	1.1705	1.3066	-0.4700
June 9.28	9.8858	0.2034	0.5805	1.3020	2.365	5 55	190 45	1.1901	1.3097	0.2178
19.26	9.9049	0.2372	-9.8515	1.3108	2.471	6 7	181 59	1.2094	1.3111	-9.4888
29.23	9.9233	0.2547	+0.3802	1.3076	2.578	6 6	173 16	1.2278	1.3106	+0.0174
July 9.20	9.9405	0.2579	0.7359	1.2921	2.682	5 55	164 28	1.2448	1.3082	0.3732
19.18	+9.9564	+0.2491	+0.9212	-1.2634	+2.782	5 35	155 32	1.2605	1.3042	+0.5584
29.15	9.9708	0.2306	1.0418	1.2197	2.876	5 11	146 25	1.2746	1.2990	0.6790
Aug. 8.12	9.9835	0.2060	1.1265	1.1573	2.961	4 46	137 2	1.2870	1.2929	0.7638
18.09	9.9946	0.1796	1.1872	1.0695	3.038	4 22	127 20	1.2979	1.2867	0.8244
28.07	0.0044	0.1571	1.2297	0.9430	3.107	4 3	117 20	1.3075	1.2811	0.8670
Sept. 7.04	+0.0130	+0.1450	+1.2572	-0.7436	+3.169	3 52	107 2	1.3160	1.2766	+0.8945
17.01	0.0208	0.1488	1.2713	-0.3300	3.226	3 50	96 32	1.3238	1.2741	0.9086
26.98	0.0282	0.1709	1.2728	+0.1282	3.281	3 58	85 54	1.3312	1.2739	0.9100
Oct. 6.96	0.0356	0.2093	1.2614	0.6819	3.338	4 15	75 15	1.3388	1.2759	0.8987
16.93	0.0434	0.2590	1.2362	0.9111	3.398	4 41	64 41	1.3469	1.2801	0.8735
26.90	+0.0519	+0.3135	+1.1954	+1.0517	+3.465	5 12	54 19	1.3557	1.2857	+0.8327
Nov. 5.88	0.0613	0.3672	1.1352	1.1479	3.541	5 46	44 10	1.3655	1.2921	0.7725
15.85	0.0716	0.4159	1.0491	1.2157	3.626	6 17	34 16	1.3762	1.2985	0.6864
25.82	0.0828	0.4570	0.9237	1.2628	3.721	6 44	24 36	1.3878	1.3041	0.5610
Dec. 5.79	0.0947	0.4889	0.7249	1.2930	3.823	7 3	15 8	1.4000	1.3083	0.3622
15.77	+0.1068	+0.5109	+0.3125	+1.3085	+3.931	7 12	5 46	1.4122	1.3107	+9.9498
25.74	0.1188	0.5230	-0.1035	1.3101	4.042	7 13	356 26	1.4243	1.3110	-9.7408
35.71	+0.1304	+0.5260	-0.6586	+1.2979	+4.151	7 4	347 5	1.4357	1.3091	-0.2958

E=+0.003

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the fixed stars, given on pages 316 to 513, from the mean places, given on pages 217 to 230. In order to render exact interpolation possible through intervals of ten days, all short period terms have been omitted.

TERMS OF SHORT PERIOD IN THE NUTATION, 1918. 215

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
an.	"	"	Feb. 15	"	"	Apr. 1	"	"	May 17	"	"
0	+0.20	+0.04	15	-0.15	+0.03	1	-0.14	-0.08	17	+0.20	+0.06
1	0.13	0.07	16	0.15	-0.02	2	-0.06	0.09	18	0.12	0.08
2	+0.04	0.08	17	0.10	0.06	3	+0.03	0.07	19	+0.02	0.08
3	-0.06	0.08	18	-0.02	0.09	4	0.11	-0.04	20	-0.07	0.07
4	0.14	0.07	19	+0.07	0.09	5	0.14	0.00	21	0.15	0.05
5	-0.21	+0.04	20	+0.16	-0.08	6	+0.14	+0.04	22	-0.20	+0.02
6	0.25	+0.01	21	0.23	0.05	7	+0.09	0.08	23	0.22	-0.01
7	0.25	-0.03	22	0.25	-0.02	8	0.00	0.09	24	0.21	0.04
8	0.21	0.06	23	0.23	+0.02	9	-0.08	0.09	25	0.16	0.07
9	0.14	0.08	24	0.18	0.05	10	0.15	0.06	26	-0.09	0.08
10	-0.04	-0.09	25	+0.10	+0.08	11	-0.18	+0.01	27	0.00	-0.08
11	+0.07	0.07	26	+0.01	0.08	12	0.16	-0.03	28	+0.08	0.06
12	0.15	-0.04	27	-0.08	0.08	13	-0.09	0.07	29	0.14	-0.03
13	0.20	0.00	28	0.17	0.06	14	+0.01	0.09	30	0.16	+0.02
14	0.19	+0.05	Mar. 1	0.23	+0.03	15	0.12	0.09	31	0.13	0.06
15	+0.13	+0.08	2	-0.26	-0.01	16	+0.21	-0.07	June 1	+0.06	+0.08
16	+0.05	0.10	3	0.25	0.04	17	0.26	-0.04	2	-0.03	0.09
17	-0.05	0.09	4	0.20	0.07	18	0.27	0.00	3	0.12	0.08
18	0.13	0.06	5	0.12	0.09	19	0.24	+0.04	4	0.19	+0.04
19	0.16	+0.02	6	-0.03	0.08	20	0.17	0.06	5	0.20	0.00
20	-0.15	-0.03	7	+0.07	-0.06	21	+0.09	+0.08	6	-0.17	-0.04
21	0.09	0.07	8	0.13	-0.03	22	-0.01	0.08	7	-0.09	0.08
22	-0.01	0.09	9	0.16	+0.02	23	0.09	0.07	8	+0.02	0.09
23	+0.09	0.09	10	0.14	0.06	24	0.17	0.05	9	0.13	0.09
24	0.17	0.07	11	+0.08	0.09	25	0.22	+0.02	10	0.21	0.06
25	+0.23	-0.04	12	-0.01	+0.09	26	-0.23	-0.02	11	+0.25	-0.03
26	0.24	0.00	13	0.09	0.08	27	0.21	0.05	12	0.26	+0.01
27	0.21	+0.03	14	0.15	+0.04	28	0.15	0.08	13	0.21	0.05
28	0.15	0.06	15	0.16	0.00	29	-0.07	0.09	14	0.14	0.07
29	+0.07	0.08	16	0.12	-0.05	30	+0.02	0.08	15	+0.05	0.08
30	-0.03	+0.08	17	-0.05	-0.08	May 1	+0.10	-0.05	16	-0.04	+0.08
31	0.12	0.07	18	+0.05	0.09	2	0.14	-0.01	17	0.13	0.06
Feb. 1	0.19	0.05	19	0.15	0.09	3	0.15	+0.03	18	0.19	+0.04
2	0.25	+0.02	20	0.22	0.06	4	0.10	0.07	19	0.22	0.00
3	0.26	-0.02	21	0.26	-0.03	5	+0.02	0.09	20	0.22	-0.03
4	-0.24	-0.05	22	+0.26	+0.01	6	-0.07	+0.09	21	-0.18	-0.06
5	0.18	0.08	23	0.21	0.05	7	0.15	0.07	22	0.11	0.08
6	-0.09	0.09	24	0.14	0.07	8	0.19	+0.03	23	-0.03	0.08
7	+0.02	0.08	25	+0.05	0.08	9	0.19	-0.02	24	+0.06	0.07
8	0.11	0.05	26	-0.04	0.08	10	0.13	0.06	25	0.14	-0.04
9	+0.17	-0.01	27	-0.13	+0.06	11	-0.04	-0.09	26	+0.17	0.00
10	0.18	+0.03	28	0.20	+0.04	12	+0.07	0.09	27	0.16	+0.04
11	0.14	0.07	29	0.24	0.00	13	0.17	0.08	28	0.10	0.08
12	+0.07	0.09	30	0.24	-0.03	14	0.24	0.05	29	+0.01	0.09
13	-0.02	0.09	31	0.21	0.06	15	0.27	-0.01	30	-0.08	0.09
14	-0.10	+0.07	Apr. 1	-0.14	-0.08	16	+0.25	+0.03	July 1	-0.16	+0.06
15	-0.15	+0.03	2	-0.06	-0.09	17	+0.20	+0.06	2	-0.19	+0.01

216 TERMS OF SHORT PERIOD IN THE NUTATION, 1918.

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
July 1	-0.16	+0.06	Aug. 16	-0.10	-0.08	Oct. 1	+0.17	+0.07	Nov. 16	-0.21	0.00
2	0.19	+0.02	17	-0.02	0.08	2	+0.08	0.08	17	0.17	-0.04
3	0.18	-0.03	18	+0.07	0.06	3	-0.01	0.08	18	-0.08	0.08
4	0.12	0.07	19	0.13	-0.03	4	0.10	0.06	19	+0.02	0.09
5	-0.02	0.09	20	0.16	+0.02	5	0.16	0.04	20	0.14	0.08
6	+0.09	-0.09	21	+0.14	+0.05	6	-0.21	+0.01	21	+0.23	-0.06
7	0.18	0.07	22	+0.08	0.08	7	0.22	-0.02	22	0.28	-0.02
8	0.24	-0.04	23	-0.01	0.09	8	0.20	0.05	23	0.27	+0.02
9	0.25	0.00	24	0.09	0.08	9	0.15	0.07	24	0.23	0.05
10	0.22	+0.04	25	0.15	+0.04	10	-0.08	0.08	25	0.15	0.07
11	+0.16	+0.07	26	-0.17	0.00	11	0.00	-0.07	26	+0.06	+0.08
12	+0.08	0.08	27	0.14	-0.04	12	+0.07	0.05	27	-0.03	0.07
13	-0.02	0.08	28	-0.06	0.08	13	0.12	-0.01	28	0.11	0.05
14	0.10	0.07	29	+0.04	0.09	14	0.12	+0.03	29	0.16	+0.03
15	0.17	0.04	30	0.14	0.09	15	0.08	0.06	30	0.19	-0.01
16	-0.22	+0.01	31	+0.22	-0.06	16	+0.01	+0.09	Dec. 1	-0.19	-0.04
17	0.23	-0.02	Sept. 1	0.26	-0.02	17	-0.07	0.09	2	0.16	0.06
18	0.20	0.05	2	0.25	+0.02	18	0.15	0.07	3	0.10	0.08
19	0.15	0.08	3	0.21	0.05	19	0.19	+0.03	4	-0.02	0.08
20	-0.07	0.08	4	0.13	0.07	20	0.18	-0.01	5	+0.06	0.07
21	+0.03	-0.08	5	+0.04	+0.08	21	-0.13	-0.06	6	+0.11	-0.04
22	0.11	0.05	6	-0.05	0.08	22	-0.03	0.08	7	0.14	0.00
23	0.16	-0.01	7	0.13	0.06	23	+0.08	0.09	8	0.12	+0.04
24	0.17	+0.03	8	0.19	+0.03	24	0.18	0.08	9	+0.07	0.07
25	0.13	0.07	9	0.22	0.00	25	0.26	0.05	10	-0.02	0.09
26	+0.06	+0.09	10	-0.22	-0.03	26	+0.28	-0.01	11	-0.11	+0.08
27	-0.03	0.09	11	0.19	0.06	27	0.26	+0.03	12	0.18	0.06
28	0.12	0.07	12	0.13	0.08	28	0.21	0.06	13	0.22	+0.02
29	0.17	+0.03	13	-0.05	0.08	29	0.12	0.08	14	0.20	-0.03
30	0.17	-0.02	14	+0.03	0.07	30	+0.03	0.08	15	0.13	0.07
31	-0.13	-0.06	15	+0.10	-0.04	31	-0.06	+0.07	16	-0.03	-0.09
Aug. 1	-0.04	0.09	16	0.13	0.00	Nov. 1	0.14	0.05	17	+0.09	0.09
2	+0.06	0.09	17	0.13	+0.04	2	0.19	+0.02	18	0.19	0.07
3	0.16	0.08	18	+0.08	0.08	3	0.20	-0.02	19	0.26	-0.03
4	0.23	0.05	19	0.00	0.09	4	0.19	0.05	20	0.27	+0.01
5	+0.25	-0.01	20	-0.08	+0.08	5	-0.15	-0.07	21	+0.24	+0.04
6	0.24	+0.03	21	0.15	0.06	6	0.09	0.08	22	0.18	0.07
7	0.18	0.06	22	0.17	+0.02	7	-0.01	0.08	23	+0.09	0.08
8	0.10	0.08	23	0.15	-0.03	8	+0.06	0.06	24	0.00	0.08
9	+0.01	0.08	24	-0.09	0.07	9	0.11	-0.03	25	-0.09	0.06
10	-0.08	+0.07	25	+0.01	-0.09	10	+0.13	+0.02	26	-0.15	+0.04
11	0.16	0.05	26	0.12	0.09	11	0.10	0.05	27	0.19	0.00
12	0.21	+0.02	27	0.21	0.07	12	+0.03	0.08	28	0.19	-0.03
13	0.23	-0.01	28	0.26	-0.04	13	-0.05	0.09	29	0.17	0.05
14	0.22	0.04	29	0.27	0.00	14	0.14	0.08	30	0.11	0.07
15	-0.18	-0.07	30	+0.24	+0.04	15	-0.20	+0.04	31	-0.04	-0.08
16	-0.10	-0.08	Oct. 1	+0.17	+0.07	16	-0.21	0.00	32	+0.04	-0.07

MEAN PLACES OF TEN-DAY STARS, 1918. 217

FOR JANUARY 0^d.450, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	" ' "	" "	" "
iscium	4.7	K0	0 1 8.326	+3.0714	-.0006	- 6 9 58.63	+20.136	+0.091
ndromedæ (<i>Alpheratz</i>)	2.2	A0p	0 4 8.739	3.0966	+0.0107	+28 38 15.87	19.879	-0.163
assiopeizæ	2.4	F5	0 4 47.614	3.1867	+0.0681	+58 41 51.14	19.860	-0.180
hœnicis	3.9	K0	0 5 15.139	3.0504	+0.0096	-46 11 59.87	19.847	-0.193
ndromedæ	5.1	F0	0 6 3.229	3.1108	+0.0021	+45 36 57.48	20.034	-0.004
egasi	2.9	B2	0 9 0.680	+3.0868	+0.0003	+14 43 39.87	+20.020	-0.010
ndromedæ	4.5	A2	0 14 2.379	3.1284	-.0044	+36 19 50.29	19.961	-0.047
eti	3.8	K0	0 15 15.015	3.0569	-.0013	- 9 16 42.20	19.971	-0.030
ucanæ	4.3	F8	0 15 48.629	3.1457	+0.2738	-65 21 22.78	21.170	+1.172
iscium	6.0	G5	0 21 11.910	3.0745	-.0014	+ 1 29 8.13	19.936	-0.023
ydri	2.9	G0	0 21 27.820	+3.1957	+0.0969	-77 42 57.82	+20.276	+0.318
hœnicis	2.4	K0	0 22 14.089	2.9718	+0.0188	-42 45 4.66	19.548	-0.403
eti	6.0	K5	0 25 51.258	3.0622	+0.0011	- 4 24 36.73	19.917	0.000
eti	5.2	G0	0 31 1.603	3.0872	+0.0273	- 4 2 38.49	19.845	-0.017
assiopeizæ	3.7	B2	0 32 23.720	3.3302	+0.0036	+53 26 44.91	19.838	-0.007
ndromedæ	4.4	B3	0 32 29.818	+3.1985	+0.0019	+33 16 5.30	+19.845	0.000
ndromedæ	4.5	G5	0 34 13.118	3.1651	-.0012	+28 52 0.11	19.569	-0.254
ndromedæ	3.5	K0	0 34 56.351	3.2028	+0.0110	+30 24 44.28	19.716	-0.097
assiopeizæ (<i>Schedir</i>)	var.	K0	0 35 50.661	3.3886	+0.0063	+56 5 16.18	19.769	-0.032
hœnicis	4.6	K0	0 37 27.122	2.8386	-.0046	-46 32 7.43	19.746	-0.032
eti	2.2	K0	0 39 28.456	+3.0123	+0.0160	-18 26 11.06	+19.790	+0.041
assiopeizæ	4.7	B2	0 40 8.949	3.3327	+0.0028	+47 50 9.02	19.732	-0.006
assiopeizæ	5.6	A2	0 40 12.420	3.9110	-.0050	+74 32 24.36	19.711	-0.026
ndromedæ	4.3	K0	0 42 59.322	3.1753	-.0073	+23 49 16.75	19.616	-0.078
assiopeizæ	3.6	F8	0 44 7.807	3.6156	+0.1432	+57 22 54.75	19.199	-0.476
iscium	4.6	K5	0 44 25.582	+3.1104	+0.0055	+ 7 8 20.61	+19.626	-0.044
ydri	5.0	K5	0 45 45.358	2.0999	+0.0425	-75 22 9.93	19.646	-0.001
eti	4.9	K0	0 48 48.940	3.0643	-.0005	- 1 35 20.88	19.589	-0.003
assiopeizæ	2.2	B0p	0 51 44.831	3.6002	+0.0036	+60 16 22.77	19.531	-0.005
ndromedæ	3.9	A2	0 52 11.782	3.3221	+0.0132	+38 3 17.36	19.558	+0.030
culptoris	4.4	B5	0 54 39.260	+2.8902	-.0018	-29 48 2.23	+19.466	-0.013
iscium	4.4	K0	0 58 41.142	3.1115	-.0054	+ 7 26 56.16	19.417	+0.026
hœnicis	3.4	K0	1 2 25.486	2.6793	-.0057	-47 9 28.77	19.282	-0.024
assiopeizæ	5.3	G5	1 2 48.178	3.9718	+0.3918	+54 31 7.48	17.742	-1.556
eti	3.6	K0	1 4 27.880	3.0175	+0.0143	-10 36 59.52	19.132	-0.126
ndromedæ	2.4	Ma	1 5 8.114	+3.3517	+0.0148	+35 11 9.98	+19.124	-0.117
iscium	4.7	K0	1 7 8.389	3.2980	+0.0056	+29 39 16.72	19.163	-0.029
iscium	5.6	A5	1 9 26.730	3.1322	+0.0096	+ 7 8 31.45	19.080	-0.052
ucanæ	5.0	F8	1 12 59.349	2.0390	+0.0744	-69 18 42.14	19.126	+0.089
iscium	5.3	A2	1 13 34.081	3.0928	-.0033	+ 3 10 58.65	18.996	-0.025
iscium	4.7	A2	1 14 57.311	+3.2915	+0.0016	+26 50 0.34	+18.974	-0.008
eti	3.8	K0	1 19 55.442	2.9978	-.0057	- 8 36 22.05	18.624	-0.215
assiopeizæ	2.8	A5	1 20 26.346	3.9031	+0.0407	+59 48 35.06	18.786	-0.037
hœnicis	3.4	K5	1 24 48.322	2.6072	-.0029	-43 44 17.77	18.464	-0.225
assiopeizæ	6.0	F5	1 25 6.233	4.4200	+0.0263	+69 50 35.55	18.607	-0.072
iscium	3.7	G5	1 27 5.542	+3.2063	+0.0015	+14 55 24.68	+18.612	-0.003
assiopeizæ	5.5	K0	1 31 56.047	4.7389	-.0011	+72 37 22.15	18.452	-0.002
ndromedæ	4.2	G0	1 31 58.658	3.5111	-.0153	+40 59 44.95	18.076	-0.377
iscium	5.6	F0	1 32 44.927	3.1769	-.0049	+11 43 20.81	18.461	+0.034
ersei	3.8	K0	1 32 57.025	3.6690	+0.0064	+48 12 47.57	18.300	-0.119
ridani (<i>Achernar</i>)	0.6	B5	1 34 39.688	+2.2360	+0.0103	-57 39 11.35	+18.319	-0.041
assiopeizæ	5.5	A0p	1 36 14.815	4.4054	+0.0088	+67 37 44.11	18.302	-0.002
iscium	4.7	K0	1 37 9.737	3.1200	-.0015	+ 5 4 23.23	18.274	+0.003
ersei	4.2	B0p	1 38 30.709	3.7460	+0.0031	+50 16 34.31	18.206	-0.015
eti	3.6	K0	1 40 15.481	2.7866	-.1198	-16 22 7.81	19.016	+0.859
iscium	4.5	K0	1 41 3.682	+3.1653	+0.0049	+ 8 44 43.03	+18.173	+0.045
culptoris	5.4	F0	1 41 48.095	+2.8044	+0.0052	-25 27 42.78	+18.049	-0.051

dup. 5-5, 6-2, 0'' 3
 top., var. irreg. 2-2, 2-8
 top., comp. 7-6, 4'' s. pr.

β Phœnicis, dup. 4-1, 4-1, 1''
 ζ Piscium, star 6-5, 24'' n. l.

κ Tucanæ, comp. 7-6, 6'' n.
 ε Sculptoris, comp. 6-6, 5'' n. l.

218 MEAN PLACES OF TEN-DAY STARS, 1918.

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect- rum.	Right Ascension.			Annual Vari- ation.	Annual P. M.	Declination.			Annual Vari- ation.
			h	m	s	s	s	°	'	"	"
ζ Ceti	3.9	K0	1 47	24.744		+2.9602	+0.0020	-10 44	22.57		+17.857
α Trianguli	3.6	F5	1 48	24.160		3.4141	+0.0015	+29 10	47.73		17.614
ε Cassiopeiae	3.4	B3	1 48	28.774		4.2874	+0.0053	+63 16	1.03		17.826
ξ Piscium	4.8	K0	1 49	18.526		3.1040	+0.0015	+ 2 46	59.58		17.829
β Arietis	2.7	A5	1 50	6.366		3.3089	+0.0064	+20 24	27.71		17.665
ψ Phœnicis	4.4	Mb	1 50	21.405		+2.4034	-0.0124	-46 42	15.20		+17.662
ν Ceti	4.2	K5	1 56	8.444		2.8257	+0.0082	-21 28	28.61		17.517
α Hydri	3.0	F0	1 56	10.726		1.8817	+0.0276	-61 58	6.83		17.551
50 Cassiopeiae	4.1	A0	1 56	24.092		5.0667	-0.0092	+72 1	31.04		17.535
γ Andromedæ pr.	2.3	K0	1 58	51.536		3.6724	+0.0046	+41 56	12.82		17.359
γ Andromedæ seq.	5.1	A	Δα	+0.842		....	....	Δδ	+4.58		....
α Arietis	2.2	K2	2 2	32.805		+3.3767	+0.0139	+23 4	31.10		+17.103
β Trianguli	3.1	A5	2 4	39.528		3.5624	+0.0126	+34 36	0.09		17.108
55 Cassiopeiae	6.2	F5	2 8	1.623		4.6721	-0.0020	+66 8	27.27		16.996
6 Persei	5.4	K0	2 8	8.531		3.9751	+0.0368	+50 41	8.09		16.826
ξ ¹ Ceti	4.5	G5	2 8	39.087		+3.1773	-0.0012	+ 8 27	45.04		+16.953
μ Fornacis	5.2	A0	2 9	17.545		2.6378	-0.0037	-31 6	30.12		16.917
γ Trianguli	4.1	A0	2 12	26.049		3.5593	+0.0040	+33 28	6.97		16.739
67 Ceti	5.7	G5	2 12	53.524		2.9908	+0.0054	- 6 47	58.37		16.658
φ Eridani	3.8	B8	2 13	34.696		2.1411	+0.0062	-51 53	29.17		16.707
ο Ceti (Mira)	† var.	Md	2 15	12.179		+3.0293	+0.0002	- 3 20	57.40		+16.429
κ Fornacis	5.4	F5	2 18	47.391		2.7448	+0.0138	-24 11	18.89		16.404
δ Hydri	4.3	A2	2 20	17.076		1.0592	-0.0097	-69 1	56.06		16.426
ι Cassiopeiae	† 4.6	A5p	2 22	17.416		4.9069	-0.0003	+67 2	4.82		16.315
ξ ² Ceti	4.3	A0	2 23	47.804		3.1868	+0.0025	+ 8 5	35.41		16.221
σ Ceti	4.8	F5	2 28	11.958		+2.8415	-0.0063	-15 36	13.56		+15.896
36 H. Cassiopeiae	5.3	K0	2 30	12.271		5.6445	-0.0052	+72 27	38.61		15.909
ν Ceti	5.0	G5	2 31	34.112		+3.1454	-0.0025	+ 5 14	10.16		15.801
μ Hydri	5.3	K0	2 33	22.374		-1.3437	+0.0425	-79 28	2.43		15.684
ν Arietis	5.4	A2	2 34	9.410		+3.4026	+0.0001	+21 36	26.95		15.658
δ Ceti	4.0	B2	2 35	16.680		+3.0734	+0.0011	- 0 1	28.13		+15.622
ε Hydri	4.3	B9	2 38	19.377		0.9148	+0.0169	-68 37	5.29		15.454
θ Persei	4.2	G0	2 38	35.445		4.0848	+0.0353	+48 52	57.11		15.347
γ Ceti seq.	† 3.7	A0	2 39	2.983		3.1062	-0.0096	+ 2 53	27.22		15.258
π Ceti	4.4	B5	2 40	13.123		2.8538	-0.0012	-14 12	19.18		15.332
μ Ceti	4.4	A5	2 40	30.393		+3.2397	+0.0188	+ 9 46	7.39		+15.302
γ Persei	† 3.9	K0	2 44	42.304		4.3596	+0.0041	+55 33	22.18		15.076
41 Arietis	3.7	B8	2 45	9.157		3.5255	+0.0050	+26 55	24.11		14.951
β Fornacis	4.5	K0	2 45	39.529		2.5121	+0.0080	-32 44	59.37		15.188
σ Arietis	5.5	B5	2 46	57.736		3.3085	+0.0016	+14 44	41.23		14.923
τ ² Eridani	4.8	K0	2 47	19.053		+2.7201	-0.0044	-21 20	28.69		+14.920
τ Persei	4.1	G0p	2 48	26.049		4.2382	+0.0008	+52 25	40.31		14.868
ι Eridani	4.0	K0	2 52	25.260		2.9304	+0.0060	- 9 13	25.68		14.422
ε Arietis (mean)	† 4.6	A2	2 54	31.161		3.4259	-0.0009	+21 0	47.17		14.499
47 H. Cephei	5.7	Ma	2 55	7.470		7.8624	-0.0102	+79 5	47.01		14.483
θ Eridani	† 3.4	A2	2 55	9.241		+2.2767	-0.0025	-40 37	57.84		+14.495
α Ceti	2.8	M	2 57	59.456		3.1335	-0.0009	+ 3 46	7.52		14.220
τ ³ Eridani	4.2	A3	2 58	46.590		2.6449	-0.0104	-23 56	42.55		14.206
γ Persei	3.1	G0p	2 58	50.866		4.3298	+0.0010	+53 11	10.99		14.241
ρ Persei	† var.	Mb	2 59	54.953		3.8363	+0.0116	+38 31	24.01		14.064
μ Horologii	5.2	F0	3 1	40.585		+1.4080	-0.0123	-60 3	18.86		+14.016
θ Hydri	5.5	B8	3 2	4.426		0.1023	+0.0034	-72 13	21.63		14.059
β Persei (Algol)	† var.	B8	3 2	49.618		3.8945	+0.0008	+40 38	26.42		13.996
δ Arietis	4.5	K0	3 6	56.215		3.4266	+0.0110	+19 25	2.93		13.740
12 Eridani	† 4.0	F8	3 8	35.202		2.5468	+0.0241	-29 18	35.18		14.270
48 H. Cephei	5.5	F0	3 9	51.871		+7.5113	+0.0204	+77 26	6.92		+13.496
ζ Arietis	5.0	A0	3 10	11.074		+3.4442	-0.0019	+20 44	28.71		+13.449

ο Ceti, var., 331^d, 1^m.7-9^m.6, star 9^m f.8
 ε Cassiop., triple, 7^m, 8^m, 2^m, 8^m
 γ Ceti, comp. 6^m.2, 2^m.7 pr.

γ Persei, star 8^m.5, 28^m n. pr.
 ε Arietis, dup., 5^m.2, 5^m.6, 1^m.2
 θ Eridani, comp. 4^m.4, f.8^m

ρ Persei, var. irreg., 3^m.4-4^m.2
 β Persei, var., 2^m.8, 3^m.1-3^m.2
 12 Eridani, comp. 7^m, 1^m.4 n. i

MEAN PLACES OF TEN-DAY STARS, 1918. 219

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect- rum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	" ' "	" "	" "
38 G. Horologii . . .	5.7	N	3 10 28.308	+1.5150	-0.0005	-57 37 42.09	+13.506	-0.006
ζ Eridani . . .	4.9	A3	3 11 50.940	2.9125	-0.0008	-9 7 24.65	13.476	+0.033
τ Arietis . . .	5.2	B3	3 16 29.388	3.4598	+0.0023	+20 51 8.08	13.086	-0.033
ε Eridani . . .	4.3	G5	3 16 39.154	+2.3980	+2.808	-43 22 57.74	13.864	+0.757
ι Hydri . . .	5.5	F2	3 17 58.486	-1.5479	+0.0351	-77 41 18.61	13.060	+0.040
α Persei . . .	1.9	F5	3 18 27.605	+4.2705	+0.0030	+49 34 13.41	+12.960	-0.028
ο Tauri . . .	3.8	G5	3 20 23.889	3.2258	-0.0046	+8 44 28.11	12.784	-0.074
2 H. Camelopardalis . . .	4.4	A0	3 22 25.078	4.8395	+0.0027	+59 39 20.86	12.723	+0.001
ξ Tauri . . .	3.8	B8	3 22 43.377	3.2488	+0.0040	+9 26 50.95	12.655	-0.046
ψ Tauri . . .	4.3	K0	3 26 20.614	3.3094	+0.0016	+12 39 23.57	12.457	+0.002
ε Eridani . . .	3.8	K0p	3 29 3.967	+2.8254	-0.0660	-9 44 5.91	+12.294	+0.027
τ ² Eridani . . .	4.3	B8	3 30 9.850	2.6484	+0.0023	-21 54 26.28	12.152	-0.039
η Persei . . .	3.1	B5	3 37 4.765	4.2612	+0.0035	+47 31 35.34	11.669	-0.036
δ Eridani . . .	3.7	K0	3 39 19.167	2.8732	-0.0061	-10 2 25.28	12.277	+0.731
ν Persei . . .	3.9	F5	3 39 37.045	4.0679	-0.0004	+42 19 14.47	11.525	0.000
5 H. Camelopardalis . . .	4.7	A0	3 41 40.749	+6.2888	+0.0059	+71 4 51.86	+11.320	-0.057
ν Tauri (<i>Alcyone</i>) . . .	3.0	B5	3 42 36.405	3.5621	+0.0016	+23 51 8.98	11.260	-0.050
τ ³ Eridani . . .	4.3	F8	3 43 19.175	2.5807	-0.0115	-23 29 25.91	10.777	-0.481
γ Eridani . . .	4.2	K0	3 46 23.169	+2.2452	-0.0036	-36 26 51.88	11.008	-0.028
ι Hydri . . .	3.2	Ma	3 48 29.551	-0.9621	+0.0097	-74 29 25.94	10.998	+0.117
ζ Persei . . .	2.9	B1	3 48 58.402	+3.7662	+0.0010	+31 38 28.07	+10.832	-0.014
9 H. Camelopardalis . . .	5.2	K0p	3 50 8.030	5.0962	+0.0003	+60 52 11.88	10.743	-0.017
ε Persei . . .	3.0	B0	3 52 20.805	4.0200	+0.0031	+39 46 26.79	10.570	-0.027
ξ Persei . . .	4.0	Oe5	3 53 38.417	3.8876	+0.0012	+35 33 22.15	10.483	-0.017
γ Eridani . . .	3.2	K5	3 54 12.188	2.7986	+0.0047	-13 44 27.57	10.348	-0.111
λ Tauri . . .	var.	B3	3 56 8.124	+3.3219	+0.0002	+12 15 34.49	+10.303	-0.011
δ Reticuli . . .	4.4	Ma	3 57 26.509	0.9414	-0.0020	-61 37 52.16	10.214	-0.002
ν Tauri . . .	3.9	A0	3 58 47.571	3.1899	+0.0008	+5 45 45.62	10.108	-0.005
Δ Tauri . . .	4.5	K0	3 59 50.682	3.5437	+0.0069	+21 51 31.94	9.976	-0.058
ε Persei . . .	4.0	B3p	4 2 42.192	4.3482	+0.0042	+47 29 41.18	9.785	-0.032
ρ Tauri . . .	5.6	F0	4 5 50.027	+3.6497	-0.0024	+26 16 4.61	+9.536	-0.042
σ ² Eridani . . .	4.1	F5	4 7 51.716	2.9275	+0.0007	-7 3 1.75	9.507	+0.086
μ Tauri . . .	4.3	B3	4 11 4.800	3.2559	+0.0016	+8 41 16.55	9.148	-0.024
α Horologii . . .	3.8	K0	4 11 17.059	1.9874	+0.0040	-42 29 46.78	8.925	-0.230
α Reticuli . . .	3.4	G5	4 13 21.837	0.7656	+0.0048	-62 40 43.96	9.038	+0.044
γ Tauri . . .	3.9	K0	4 15 7.489	+3.4119	+0.0083	+15 25 50.15	+8.830	-0.026
δ Tauri . . .	3.9	K0	4 18 12.212	3.4572	+0.0075	+17 21 4.29	8.583	-0.030
ν ² Eridani . . .	4.1	K5	4 20 57.392	+2.2529	+0.0052	-34 12 24.13	8.438	+0.042
δ Mensæ . . .	5.6	K0	4 23 28.841	-4.1392	+0.0042	-80 24 25.54	8.266	+0.072
ε Tauri . . .	3.6	K0	4 23 49.587	+3.5011	+0.0082	+18 59 58.56	8.133	-0.034
μ Persei . . .	6.1	F0	4 27 38.472	+4.2158	+0.0012	+42 53 23.86	+7.865	+0.004
α Tauri (<i>Aldebaran</i>) . . .	1.1	K5	4 31 12.798	3.4403	+0.0047	+16 20 43.69	7.384	-0.189
ν Eridani . . .	4.1	B2	4 32 13.227	2.9959	-0.0005	-3 31 8.93	7.491	0.000
α Doradus . . .	3.5	A0p	4 32 13.404	1.2950	+0.0067	-55 12 51.39	7.480	-0.011
53 Eridani . . .	4.0	K0	4 34 25.392	2.7456	-0.0061	-14 27 48.26	7.158	-0.154
τ Tauri . . .	4.3	B5	4 37 19.291	+3.5990	+0.0007	+22 48 2.40	+7.056	-0.070
Groombridge 848 . . .	6.0	F0	4 37 46.387	8.0250	+0.0094	+75 47 39.06	6.894	-0.144
α Coeli . . .	4.5	F2	4 37 55.055	1.9301	-0.0149	-42 1 12.37	6.920	-0.106
4 Camelopardalis . . .	5.4	A2	4 41 9.997	4.9878	+0.0062	+56 36 46.95	6.612	-0.148
μ Eridani . . .	4.2	B5	4 41 24.090	2.9989	+0.0011	-3 24 14.37	6.732	-0.009
τ ⁴ Orionis . . .	3.3	F8	4 45 23.237	+3.2553	+0.0312	+6 49 9.19	+6.435	+0.023
9 Camelopardalis . . .	4.4	B0	4 45 53.387	5.9501	+0.0038	+66 12 18.65	6.375	+0.005
ι Tauri . . .	5.1	F0	4 46 34.518	3.5079	+0.0059	+18 42 4.89	6.278	-0.035
τ ⁵ Orionis . . .	3.9	B3	4 49 58.753	3.1242	+0.0002	+2 18 26.85	6.034	+0.005
ι Aurigæ . . .	2.9	K2	4 51 39.060	3.9043	+0.0009	+33 2 14.77	5.868	-0.021
ε Aurigæ . . .	var.	F5p	4 56 4.922	+4.3018	+0.0012	+43 42 11.62	+5.505	-0.013
β Camelopardalis . . .	4.2	G0	4 56 7.002	+5.3269	-0.0004	+60 19 26.60	+5.504	-0.011

38 Horologii, remarkable purplish red star.

ε Eridani, comp. 9^m, s. 7^m.

ν Tauri, quad., comps. 6^m.3, 7^m.6, 8^m.2, 11^m.7, 181^m, 190^m.

9 H. Camelop., comp. 8^m, 1^m.9 n. f.

ε Persei, comp. 8^m, 8^m.6 n. f.

λ Tauri, var., 34.95, 3^m.3-4^m.2

Δ Tauri, star 6^m.5 f. 38^m, 253^m s.

μ Persei, star 6^m, 115^m s. pr.

ε Aurigæ, var. irreg., 5^m.0-6^m.5

220 MEAN PLACES OF TEN-DAY STARS, 1918.

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	" ' "	"	"
ζ Aurigæ	3.9	K0p	4 56 44.592	+4.1900	+0.013	+40 57 26.88	+5.441	-0.022
ι Tauri	4.7	A5	4 58 11.591	3.5850	+0.056	+21 28 25.73	5.291	-0.049
11 Orionis	4.6	B9	4 59 52.930	3.4268	+0.013	+15 17 27.47	5.162	-0.036
η Aurigæ	3.3	B3	5 0 45.730	4.2046	+0.039	+41 7 29.38	5.052	-0.071
ε Leporis	3.3	K5	5 1 59.350	2.5385	+0.012	-22 28 49.27	4.956	-0.064
β Eridani	2.9	A2	5 3 49.097	+2.9493	-0.056	- 5 11 29.23	+4.791	-0.074
μ Aurigæ	4.8	A3	5 7 48.843	4.1021	-0.020	+38 23 18.95	4.445	-0.080
19 H. Camelopardalis	5.2	F8	5 9 1.021	9.8392	-0.075	+79 8 23.81	4.578	+0.155
μ Leporis	3.3	A0p	5 9 14.855	2.6940	+0.027	-16 18 6.09	4.375	-0.028
β Orionis (Rigel)	† 0.3	B8p	5 10 35.774	2.8824	.0000	- 8 17 43.56	4.288	0.003
α Aurigæ (Capella)	0.2	G0	5 10 37.735	+4.4292	+0.086	+45 54 57.53	+3.856	-0.429
λ Aurigæ	4.8	G0	5 13 22.239	4.2180	+0.041	+40 1 39.01	3.391	-0.659
τ Orionis	3.7	B5	5 13 37.464	2.9126	-0.009	- 6 55 55.45	4.024	-0.005
ο Columbae	4.9	K0	5 14 31.451	2.1588	+0.027	-34 58 29.75	3.600	-0.352
γ Orionis (Bellatrix)	1.7	B2	5 20 43.928	3.2171	-0.004	+ 6 16 34.97	3.401	-0.017
β Tauri	1.8	B8	5 21 6.427	+3.7915	+0.025	+28 32 21.73	+3.209	-0.177
17 Camelopardalis	5.8	K5	5 22 25.304	5.6606	+0.003	+63 0 1.48	3.265	-0.007
β Leporis	3.0	G0	5 24 43.910	2.5704	.0000	-20 49 26.20	2.984	-0.089
χ Aurigæ	4.9	B1	5 27 23.375	3.9042	+0.006	+32 7 57.16	2.829	-0.013
δ Orionis	† 2.5	B0	5 27 49.002	3.0644	.0000	- 0 21 31.88	2.803	-0.002
Groombridge 966	6.4	K5	5 28 45.075	+8.0108	-0.002	+74 59 31.18	+2.742	+0.017
α Leporis	2.7	F0	5 29 6.802	2.6458	+0.003	-17 52 48.56	2.693	0.000
φ ¹ Orionis	4.5	B0	5 30 19.071	3.2927	-0.002	+ 9 26 5.91	2.573	-0.015
ι Orionis	† 2.9	Oe5	5 31 25.293	2.9343	+0.001	- 5 57 46.17	2.491	-0.002
ε Orionis	1.8	B0	5 32 3.119	3.0436	.0000	- 1 15 11.76	2.440	+0.001
ζ Tauri	3.0	B3	5 32 44.605	+3.5851	+0.006	+21 5 36.75	+2.346	-0.032
ζ Orionis	† 2.0	B0	5 36 37.254	3.0271	+0.005	- 1 59 6.44	2.027	-0.014
α Columbae	2.8	B5p	5 36 40.782	2.1726	+0.006	-34 7 2.00	1.998	-0.038
ο Aurigæ	5.5	A0	5 39 32.753	4.6454	-0.018	+49 47 30.17	1.768	-0.018
ζ Leporis	3.7	A2	5 43 14.362	2.7180	-0.013	-14 51 5.86	1.464	-0.001
κ Orionis	2.2	B0	5 43 52.031	+2.8450	+0.001	- 9 41 52.25	+1.407	-0.003
δ Doradus	4.5	A5	5 44 37.415	0.1024	-0.081	-65 45 58.66	1.343	-0.001
ν Aurigæ	4.2	K0	5 45 48.356	4.1575	-0.001	+39 7 32.94	1.254	+0.013
δ Leporis	3.9	K0	5 47 47.663	2.5796	+0.012	-20 53 6.69	0.418	-0.649
α Orionis (Betelgeuse)	† var.	Ma	5 50 43.931	3.2479	+0.020	+ 7 23 34.14	0.820	+0.009
η Leporis	3.8	F5	5 52 40.193	+2.7324	-0.028	-14 10 54.48	+0.782	+0.141
δ Aurigæ	3.9	K0	5 52 46.578	4.9420	+0.018	+54 16 48.19	0.513	-0.118
β Aurigæ	2.1	A0p	5 53 30.866	4.4019	-0.038	+44 56 25.78	0.561	-0.006
θ Aurigæ	† 2.7	A0p	5 54 7.777	4.0917	+0.047	+37 12 28.98	+0.423	-0.091
1 Geminorum	4.3	G5	5 59 8.153	3.6475	+0.002	+23 16 7.80	-0.033	-0.109
1 G. Puppis	† 6.2	F8	6 2 6.808	+1.7259	-0.088	-45 2 9.76	+0.040	+0.225
ν Orionis	4.4	B2	6 2 53.437	3.4265	+0.012	+14 46 45.52	-0.278	-0.025
22 H. Camelopardalis	4.7	A0	6 9 48.843	6.6180	+0.026	+69 21 2.50	0.972	-0.114
η Geminorum	† var.	Ma	6 9 55.721	3.6227	-0.039	+22 31 54.03	0.884	-0.016
2 Lyncis	4.4	A0	6 12 23.502	5.2984	+0.012	+59 2 32.46	1.054	+0.030
ζ Canis Majoris	3.1	B3	6 17 9.831	+2.3019	-0.006	-30 1 35.55	-1.523	-0.023
μ Geminorum	3.2	Ma	6 18 0.017	3.6307	+0.046	+22 33 24.62	1.687	-0.114
φ ¹ Aurigæ	5.1	K2	6 18 35.164	4.6258	+0.029	+49 19 52.40	1.627	-0.004
β Canis Majoris	2.0	B1	6 19 5.296	2.6416	-0.006	-17 54 51.34	1.664	+0.004
8 Monocerotis	† 4.5	A5	6 19 25.405	3.1802	-0.004	+ 4 38 7.86	1.688	+0.009
α Argus (Canopus)	-0.9	F0	6 22 7.897	+1.3319	+0.022	-52 39 1.97	-1.924	+0.009
10 Monocerotis	5.0	B3	6 23 54.682	2.9641	+0.010	- 4 42 37.61	2.081	+0.006
ν Geminorum	4.1	B5	6 24 5.668	3.5629	-0.005	+20 15 54.64	2.119	-0.016
8 Lyncis	6.0	G0	6 30 12.096	5.4915	-0.027	+61 33 17.93	2.910	-0.276
ε ² Canis Majoris	4.5	A0	6 31 37.202	2.5158	+0.022	-22 53 54.58	2.722	+0.035
23 H. Camelopardalis	5.6	F8	6 32 15.866	+10.2941	-0.0279	+79 39 22.49	-3.445	-0.633
γ Geminorum	1.9	A0	6 32 58.530	+3.4670	+0.033	+16 28 13.15	-2.922	-0.048

β Orionis, comp. 8^m.0, 9^m.5 s. pr.
 δ Orionis, star 6^m.9, 52^m.6 n.
 ε Orionis, comp. 7^m.3, 11^m.5 s. f.

ζ Orionis, comp. 4^m.2, 2^m.4 s. f.
 α Orionis, red star, var. irreg., 1^m.0-1^m.4
 θ Aurigæ, comp. 7^m.5, 2^m.5 n. pr.

1 Puppi, star 5^m.8, 150^m.1 s. f.
 η Gem., var. 231^m.4, 3^m.2-4^m.2 comp.
 8^m.8, 1^m.1^m.2 n. pr.
 8 Monoc., star 6^m.5, 13^m.7 n. f.

MEAN PLACES OF TEN-DAY STARS, 1918. 221

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect- rum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	" "	" "	" "
igae	5.7	K0	6 32 58.694	+4.1595	-.0020	+39 27 51.81	-2.987	-0.113
is	3.2	B8	6 35 15.219	1.8367	+.0008	-43 7 24.66	3.090	-0.019
ocerotis	4.7	Oe5	6 36 27.750	3.3046	.0000	+ 9 58 21.33	3.184	-0.008
inorum	3.2	G5	6 38 53.282	3.6927	-.0001	+25 12 48.55	3.403	-0.018
inorum	3.4	F5	6 40 41.265	3.3684	-.0076	+12 59 6.30	3.733	-0.193
igae	5.3	G0	6 40 49.950	+4.3295	+.0018	+43 39 37.31	-3.392	+0.160
is Majoris (<i>Sirius</i>) †	-1.6	A0	6 41 32.077	2.6434	-.6373	-16 36 10.21	4.820	-1.206
ocerotis	4.7	K0	6 43 35.091	3.1281	-.0020	+ 2 30 10.40	3.805	-0.016
elopardalis	5.1	B5	6 44 52.337	6.4870	+.0021	+68 59 8.34	3.888	+0.012
oris	3.3	A5	6 47 21.093	0.6175	-.0104	-61 51 11.78	3.874	+0.238
inorum	3.6	A2	6 47 23.203	+3.9579	+.0010	+34 3 40.85	-4.165	-0.050
is	2.8	K0	6 47 54.073	1.4883	+.0025	-50 31 0.59	4.266	-0.107
cis	4.5	K0	6 50 11.009	5.2061	+.0021	+58 31 54.66	4.484	-0.130
is Majoris	4.2	K2	6 50 22.836	2.7880	-.0091	-11 56 5.62	4.378	-0.007
is Majoris	1.6	B1	6 55 24.174	2.3575	-.0001	-28 51 34.89	4.796	+0.003
inorum	† var.	G0	6 59 14.808	+3.5605	-.0002	+20 41 29.92	-5.132	-0.007
is Majoris	3.1	B5p	6 59 36.025	2.5049	-.0006	-23 42 45.43	5.149	+0.005
is Majoris	4.1	B5	7 0 2.934	2.7148	+.0003	-15 30 40.48	5.202	-0.010
is Majoris	2.0	F8	7 5 3.369	2.4382	-.0615	-26 15 43.98	5.611	+0.003
igae	5.1	K2	7 6 1.123	4.1325	+.0052	+39 27 20.00	5.698	-0.003
inorum	5.3	Mb	7 8 39.865	+3.4479	+.0019	+16 17 57.02	-5.958	-0.042
antis	3.9	K0	7 9 26.778	-0.5022	+.0004	-70 21 57.60	5.904	+0.078
inorum	3.6	A2	7 13 22.922	+3.4501	-.0029	+16 41 21.45	6.354	-0.045
is	2.7	K5	7 14 14.799	2.1189	-.0003	-36 56 59.34	6.390	-0.010
inorum	† 3.5	F0	7 15 13.672	+3.5862	-.0010	+22 8 3.88	6.477	-0.015
antis	4.0	F5	7 16 52.938	-0.0201	+.0004	-67 48 25.94	-6.605	-0.006
inorum	3.9	K0	7 20 38.168	+3.7301	-.0086	+27 57 43.81	6.996	-0.087
is Majoris	2.4	B5p	7 20 51.144	2.3738	+.0003	-29 8 32.53	6.919	+0.007
ymbridge 1308	5.8	K0	7 22 21.784	6.2723	+.0018	+68 38 5.80	7.095	-0.045
is Minoris	3.1	B8	7 22 42.305	3.2553	-.0032	+ 8 27 19.80	7.125	-0.047
inorum	4.2	F0	7 23 50.378	+3.8627	+.0118	+31 56 55.95	-6.987	+0.183
is	† 3.3	K5	7 26 37.702	1.9018	-.0072	-43 8 5.30	7.218	+0.180
inorum (<i>Castor</i>)	2.0	A0	7 29 22.235	3.8328	-.0144	+32 4 11.37	7.702	-0.082
inorum	2.8	A0	$\Delta\alpha$ -0.250	...	...	$\Delta\delta$ -4.12	...	...
ocerotis	5.2	F5	7 33 12.045	2.9818	-.0066	- 3 55 36.86	7.907	+0.022
Min. (<i>Procyon</i>) †	0.5	F5	7 35 0.618	+3.1419	-.0471	+ 5 26 9.26	-9.111	-1.037
cis	5.0	A2	7 36 4.671	5.0922	-.0042	+58 54 13.27	8.216	-0.056
inorum	† 3.7	G5	7 39 30.002	3.6262	-.0014	+24 35 44.21	8.492	-0.060
inorum (<i>Pollux</i>)	1.2	K0	7 40 18.044	3.6754	-.0470	+28 13 31.08	8.550	-0.055
pis	5.1	F2	7 42 10.326	2.7636	-.0003	-14 21 49.24	8.646	-0.002
is	3.5	G0	7 45 50.735	+2.5232	-.0004	-24 39 11.50	-8.932	0.000
inorum	5.0	A2	7 48 28.911	3.6762	-.0020	+26 58 44.98	9.165	-0.027
cis	5.7	K0	7 48 44.914	4.3804	-.0022	+47 46 42.22	9.164	-0.006
ymbridge 1374	5.6	K0	7 50 24.529	7.2885	-.0023	+74 8 20.17	9.324	-0.037
is	3.6	B3	7 54 41.669	1.5258	-.0043	-52 45 43.54	9.613	+0.006
ri	5.9	K0	7 55 58.308	+3.6335	+.0003	+25 37 5.73	-9.720	-0.004
inorum	5.0	K0	7 58 29.129	3.6899	-.0012	+28 1 30.66	9.960	-0.053
cis	4.9	A2	8 2 17.926	4.5287	-.0032	+51 44 39.61	10.199	-0.003
is	2.9	F5	8 4 3.091	2.5547	-.0065	-24 4 1.46	10.276	+0.052
rsee Majoris	5.5	G5	8 4 40.251	6.0083	+.0002	+68 43 1.50	10.369	+0.005
is	† 2.2	Oap	8 7 0.396	+1.8498	-.0003	-47 5 40.33	-10.560	-0.011
ri (<i>mean</i>)	† 4.7	G0	8 7 30.686	3.4442	+.0051	+17 53 46.03	10.715	-0.129
lley 1147	5.7	G5	8 9 16.694	7.6129	+.0077	+76 0 32.44	10.725	-0.008
pis	5.0	G5	8 9 33.830	2.7679	-.0009	-15 32 25.32	10.737	+0.001
ri	3.8	K2	8 12 4.171	3.2555	-.0035	+ 9 26 20.96	10.975	-0.052
cis	4.4	K5	8 17 13.776	+4.1199	+.0015	+43 27 8.30	-11.398	-0.100
ri	5.9	F0	8 18 40.255	+3.4387	-.0038	+18 35 46.87	-11.433	-0.031

.. comp. 8^m.8, 2^m.9 s. pr.
 5 dup. 4^m.9, 6^m.2, 0^m.7
 (aj), comp. 9^m, 7^m.8 s. f.
 var., 10^m.15, 3^m.7-4^m.3

† Volantis, comp. 5^m.8, 12^m.9 n. pr.
 † Gem., comp. 6^m, 7^m.0 s. pr.
 † Argus, star 8^m, 22^m.4 n. f.
 † Gem., comp. 8^m.5, 6^m.6 s. pr.

† Argus, star 5^m, 42^m.5 s. pr.
 † Cancer, triple; binary 5^m.6, 6^m.3, 1^m,
 with comp. 6^m.0, 5^m.4 s. f.

ions given for Sirius and Procyon are those of the centers of their orbits. Corrections given on page x remain-
 d to reduce to the positions of the stars.

222 MEAN PLACES OF TEN-DAY STARS, 1918.

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]
ε Argus	1.7	KOp	8 20 49.948	+1.2335	-.0042	-59 14 43.11	-11.550
30 Monocerotis	4.0	A0	8 21 33.867	+2.9995	-.0039	- 3 38 17.05	11.629
θ Chamæleontis	4.3	K0	8 23 7.370	-1.7522	-.0451	-77 13 13.92	11.703
ο Ursæ Majoris	3.5	G0	8 23 27.941	+5.0099	-.0160	+60 59 36.92	11.856
Groombridge 1450	6.0	K0	8 27 35.444	3.9084	-.0082	+38 17 54.98	12.214
η Cancrī	5.5	K0	8 27 58.183	+3.4740	-.0025	+20 43 14.01	-12.116
Groombridge 1446	6.3	K0	8 30 37.430	6.7382	-.0043	+73 55 4.14	12.363
δ Hydræ	4.2	A0	8 33 18.998	3.1779	-.0048	+ 5 59 25.87	12.446
σ Hydræ	4.5	K0	8 34 28.382	3.1381	-.0008	+ 3 37 48.68	12.523
γ Cancrī	4.7	A0	8 38 32.631	3.4764	-.0071	+21 45 51.34	12.830
δ Cancrī	4.2	K0	8 40 1.670	+3.4134	-.0009	+18 27 23.34	-13.127
α Pyxidīs	3.7	B2	8 40 17.795	2.4111	-.0003	-32 53 24.57	12.894
ι Cancrī	4.2	G5	8 41 44.373	3.6373	-.0006	+29 3 38.55	13.052
ε Hydræ	3.5	F8	8 42 26.120	3.1795	-.0127	+ 6 43 13.85	13.096
δ Argus	2.0	A0	8 42 26.153	1.6516	-.0035	-54 24 27.62	13.147
σ² Cancrī (mean)	5.5	K0	8 49 14.758	+3.6673	+0.0034	+30 53 26.99	-13.515
ζ Hydræ	3.3	K0	8 51 3.677	3.1742	-.0060	+ 6 15 30.20	13.604
ι Ursæ Majoris	3.1	A5	8 53 36.080	4.1214	-.0435	+48 21 52.22	14.021
α Cancrī	4.3	A3	8 54 0.277	3.2842	+0.0024	+12 10 33.09	13.840
b¹ Carinæ	5.1	B3	8 54 57.967	1.4680	-.0034	-58 54 45.54	13.878
κ Ursæ Majoris	3.7	A0	8 58 2.107	+4.1094	-.0027	+47 28 54.20	-14.119
σ² Ursæ Majoris	4.9	F8	9 3 11.961	5.3181	-.0003	+67 28 7.09	14.437
κ Cancrī	5.1	B8	9 3 18.477	3.2524	-.0012	+10 59 56.09	14.390
λ Argus	2.2	K5	9 4 58.756	2.2063	-.0015	-43 6 4.28	14.485
θ Hydræ	3.8	A0	9 10 5.983	3.1234	+0.0088	+ 2 39 39.46	15.097
β Argus	1.8	A0	9 12 18.333	+0.6689	-.0310	-69 22 45.65	-14.821
83 Cancrī	6.6	F5	9 14 24.485	3.3532	-.0076	+18 3 13.16	15.173
ι Argus	2.2	F0	9 14 53.594	1.6040	-.0055	-58 55 50.62	15.058
40 Lyncis	3.3	K5	9 16 3.868	3.6627	-.0178	+34 44 24.28	15.120
θ Pyxidīs	4.9	Ma	9 17 51.535	2.6515	-.0048	-25 36 58.68	15.267
α Hydræ	2.2	K2	9 23 33.499	+2.9486	-.0010	- 8 18 8.96	-15.521
h Ursæ Majoris	3.8	F0	9 25 4.950	4.7621	+0.0183	+63 25 16.73	15.613
d Ursæ Majoris	4.6	G0	9 27 15.533	5.3552	-.0112	+70 11 30.37	15.685
g Ursæ Majoris	3.3	F8	9 27 22.944	4.0287	-.1026	+52 3 6.80	16.305
ψ Argus	3.6	F5	9 27 28.041	2.3596	-.0181	-40 6 27.21	15.729
ξ Leonis	5.1	G5	9 27 31.684	+3.2366	-.0063	+11 39 49.04	-15.854
10 Leonis Minoris	4.6	G5	9 29 12.336	3.6842	+0.0011	+36 45 44.67	15.882
ο Leonis	3.8	F5p	9 36 46.575	3.2047	-.0096	+10 15 57.96	16.290
θ Antliæ	5.0	F5	9 40 32.753	2.6732	-.0036	-27 23 36.67	16.418
ε Leonis	3.1	GOp	9 41 12.003	3.4104	-.0034	+24 9 8.52	16.502
v Argus	3.2	F0	9 45 3.190	+1.5007	-.0025	-64 41 29.40	-16.687
v Ursæ Majoris	3.9	F0	9 45 10.324	4.2897	-.0382	+59 25 30.68	16.833
6 Sextantis	6.0	A3	9 47 6.161	3.0244	+0.0011	- 3 51 30.38	16.797
μ Leonis	4.1	K0	9 48 6.172	3.4165	-.0171	+26 23 37.64	16.871
Groombridge 1586	6.0	K0	9 51 5.021	5.4240	-.0197	+73 16 12.74	17.017
19 Leonis Minoris	5.2	F5	9 52 40.082	+3.6840	-.0111	+41 26 48.59	-17.052
φ Argus	3.7	B5	9 53 58.862	2.1019	-.0033	-54 10 38.22	17.111
π Leonis	4.9	Ma	9 55 52.892	3.1720	-.0029	+ 8 26 17.49	17.203
η Leonis	3.6	AOp	10 2 51.769	3.2723	-.0022	+17 9 47.06	17.488
α Leonis (Regulus)	1.3	B8	10 4 0.419	3.1979	-.0169	+12 22 6.46	17.534
λ Hydræ	3.8	K0	10 6 35.428	+2.9247	-.0137	-11 56 53.62	-17.728
q Velorum	4.1	A2	10 11 17.400	2.5133	-.0153	-41 42 55.08	17.800
32 Ursæ Majoris	5.7	A3	10 12 5.828	4.3900	-.0140	+65 31 4.97	17.877
ζ Leonis	3.6	F0	10 12 7.980	3.3417	+0.0014	+23 49 35.26	17.875
λ Ursæ Majoris	3.5	A0	10 12 9.527	3.6299	-.0142	+43 19 28.05	17.905
γ Leonis pr.	2.6	K0	10 15 27.249	+3.3111	+0.0212	+20 15 24.56	-18.147
μ Ursæ Majoris	3.2	K5	10 17 27.031	+3.5848	-.0068	+41 54 44.70	-18.045

ι Cancrī, star 6^m.6, 30["].6 n. pr.
 ε Hydræ, triple; binary 3^m.5, 6^m.8,
 0["].2, with comp. 7^m.8, 3["].3
 ε Argus, comp. 5^m, 2["].8.

σ² Cancrī, dup., 5^m.9, 6^m.4, 1["].4
 b¹ Carinæ, comp. 7^m.2, 5["].1
 σ² Urs. Maj., binary, 4^m.9, 8^m, 1["].3

ψ Argus, dup., 3^m.8, 6^m.0, 0["].
 v Argus, comp. 6^m.0, 4["].9 a. i
 γ Leonis, comp. 3^m.5, 3["].7 s.

MEAN PLACES OF TEN-DAY STARS, 1918. 223

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	" ' "	" "	" "
30 H. Ursæ Majoris . . .	4.9	A0	10 18 14.521	+4.3585	-.0024	+65 58 54.11	-18.120	-0.018
μ Hydræ . . .	4.1	K5	10 22 7.437	2.9007	-.0089	-16 25 1.99	18.324	-0.079
31 Leonis Minoris . . .	4.4	K0	10 23 8.856	3.4782	-.0094	+37 7 40.02	18.394	-0.112
α Antliæ . . .	4.4	K5	10 23 23.857	2.7427	-.0060	-30 39 0.86	18.314	-0.023
36 Ursæ Majoris . . .	4.8	F5	10 25 23.431	3.8588	-.0208	+56 24 5.36	18.400	-0.039
9 H. Draconis . . .	5.0	G5	10 28 9.927	+5.1765	-.0084	+76 8 9.58	-18.467	-0.009
ρ Leonis . . .	3.8	B0p	10 28 29.720	3.1614	-.0004	+ 9 43 44.46	18.472	-0.003
33 Sextantis . . .	6.4	K0	10 37 13.889	3.0519	-.0100	- 1 18 35.65	18.863	-0.110
41 Leonis Minoris . . .	5.0	A2	10 38 57.642	3.2666	-.0084	+23 37 5.12	18.796	+0.009
θ Argus . . .	3.0	B0	10 40 1.621	2.1330	-.0043	-63 57 54.56	18.864	-0.027
42 Leonis Minoris . . .	5.4	B9	10 41 18.555	+3.3418	-.0024	+31 6 52.41	-18.917	-0.041
η Argus . . .	†	var.	10 41 52.556	2.3215	-.0002	-59 15 11.48	18.901	-0.009
μ Argus . . .	†	G5	10 43 14.332	2.5742	+0.0066	-48 59 12.95	19.012	-0.081
ι Leonis . . .	5.3	A0	10 44 56.942	3.1562	+0.0001	+10 58 45.65	19.013	-0.033
δ Chamæleontis . . .	†	B3	10 45 1.608	0.5911	-.0192	-80 6 27.63	18.986	-0.004
ν Hydræ . . .	3.3	Ma	10 45 34.649	+2.9584	+0.0061	-15 45 50.45	-18.787	+0.211
46 Leonis Minoris . . .	3.9	K0	10 48 43.836	3.3627	+0.0074	+34 39 26.34	19.367	-0.283
54 Leonis . . .	†	A0	10 51 10.571	3.2525	-.0060	+25 11 14.75	19.166	-0.018
ι Antliæ . . .	4.7	K0	10 52 53.904	2.7965	+0.0112	-36 41 48.21	19.330	-0.138
Groombridge 1706 . . .	6.3	G5	10 53 26.129	4.8797	-.0264	+78 12 35.30	19.241	-0.035
α Crateris . . .	4.2	K0	10 55 46.657	+2.9208	-.0327	-17 51 43.41	-19.156	+0.108
d Leonis . . .	5.0	K0	10 56 19.579	3.0991	+0.0004	+ 4 3 28.79	19.299	-0.022
β Ursæ Majoris . . .	2.4	A0	10 56 54.234	3.6388	+0.0105	+56 49 20.09	19.265	+0.026
α Ursæ Majoris . . .	2.0	K0	10 58 40.859	3.7262	-.0164	+62 11 38.30	19.403	-0.071
χ Leonis . . .	4.7	F0	11 0 47.301	3.0960	-.0234	+ 7 46 46.96	19.420	-0.041
φ Leonis . . .	5.7	K0	11 2 43.307	+3.0612	-.0253	+ 2 24 3.76	-19.503	-0.080
ψ Ursæ Majoris . . .	3.2	K0	11 5 3.622	3.3840	-.0053	+44 56 37.30	19.505	-0.033
φ Crateris . . .	4.5	A2	11 7 37.373	2.9479	-.0000	-22 22 41.03	19.630	-0.106
δ Leonis . . .	2.6	A2	11 9 45.019	3.1949	+0.0108	+20 58 23.30	19.706	-0.141
θ Leonis . . .	3.4	A0	11 9 56.310	3.1502	-.0049	+15 52 40.66	19.654	-0.085
ν Ursæ Majoris . . .	3.7	K0	11 14 3.245	+3.2473	-.0018	+33 32 31.12	-19.618	+0.026
δ Crateris . . .	3.8	K0	11 15 14.373	2.9976	-.0088	-14 20 4.66	19.469	+0.195
δ Leonis . . .	4.1	A0	11 16 54.555	3.0949	-.0062	+ 6 28 44.39	19.705	-0.013
π Centauri . . .	4.3	B5	11 17 15.726	2.7270	-.0041	-54 2 29.37	19.711	-0.013
ι Leonis . . .	†	F5	11 19 39.020	3.1284	+0.0103	+10 58 51.85	19.819	-0.083
τ Leonis . . .	5.2	K0	11 23 43.242	+3.0857	+0.0008	+ 3 18 28.86	-19.811	-0.016
λ Draconis . . .	4.1	Ma	11 26 33.223	3.5932	-.0072	+69 47 1.70	19.853	-0.021
ξ Hydræ . . .	3.7	G5	11 28 57.951	2.9467	-.0158	-31 24 13.93	19.916	-0.055
λ Centauri . . .	3.3	B9	11 31 59.394	2.7515	-.0073	-62 33 57.80	19.922	-0.027
ν Leonis . . .	4.5	K0	11 32 45.013	3.0716	-.0000	- 0 22 15.20	19.885	+0.039
π Chamæleontis . . .	5.7	F0	11 33 52.188	+2.4549	-.0323	-75 26 33.40	-19.938	-0.023
3 Draconis . . .	5.5	K0	11 37 54.764	3.3706	-.0080	+67 11 55.68	19.918	+0.035
ζ Crateris . . .	4.9	G5	11 40 36.267	3.0380	+0.0018	-17 53 41.30	20.015	-0.041
χ Ursæ Majoris . . .	3.8	K0	11 41 43.628	3.1790	-.0128	+48 14 2.78	19.962	+0.020
β Leonis (Denebola) . . .	2.2	A2	11 44 52.715	3.0622	-.0341	+15 1 49.80	20.120	-0.118
β Virginis . . .	3.8	F8	11 46 25.436	+3.1252	+0.0494	+ 2 13 36.88	-20.285	-0.275
Groombridge 1830 . . .	6.5	G5	11 48 15.477	3.4668	+0.3400	+38 18 26.30	25.803	-5.784
γ Ursæ Majoris . . .	2.5	A0	11 49 31.522	3.1687	+0.0115	+54 9 2.45	20.020	+0.004
π Virginis . . .	4.6	A3	11 56 40.255	3.0742	-.0009	+ 7 4 17.65	20.075	-0.032
ο Virginis . . .	4.2	G5	12 1 1.965	3.0569	-.0148	+ 9 11 17.93	20.013	+0.032
δ Centauri . . .	2.9	B3p	12 4 6.083	+3.0964	-.0050	-50 15 57.26	-20.072	-0.030
ε Corvi . . .	3.2	K0	12 5 54.288	3.0816	-.0051	-22 9 49.63	20.036	+0.003
4 H. Draconis . . .	5.1	A5	12 8 22.495	2.8441	+0.0026	+78 4 18.70	20.012	+0.019
δ Crucis . . .	3.1	B3	12 10 47.240	3.1766	+0.0021	-58 17 35.39	20.062	-0.038
δ Ursæ Majoris . . .	3.4	A2	12 11 22.601	2.9836	+0.0150	+57 29 17.49	20.015	+0.005
γ Corvi . . .	2.8	B8	12 11 35.186	+3.0820	-.0114	-17 5 11.84	-20.003	+0.017
2 Canum Venaticorum † . . .	5.8	K5	12 12 1.371	+3.0154	+0.0038	+41 6 59.21	-20.064	-0.046

γ Argus, var. irreg., 1=6-6=6
 α Argus, comp. 7=, 2'=2 n. l.

δ Cham., star 5=5 pr. 32, 256" n.
 54 Leonis, comp. 6=3, 6'=4 s. l.

ι Leonis, comp. 6=8, 2'=6 n. l.
 2 Can. Ven., star 8=, 11'=6 s. pr.

224 MEAN PLACES OF TEN-DAY STARS, 1918.

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect. trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.
			h m s	s	s	° ' "	"
β Chamæleontis . . .	4.4	B5	12 13 30.277	+3.4534	-.0188	-78 51 24.92	-19.994
η Virginis . . .	4.0	A0	12 15 42.637	3.0694	-.0036	- 0 12 40.33	20.026
α^1 Crucis . . .	1.6	B1	12 22 1.495	3.3141	-.0064	-62 38 41.42	19.992
α^2 Crucis . . .	2.1		$\Delta\alpha$ +0.627	....	....	$\Delta\delta$ -1.86	....
20 Comæ . . .	5.7	A2	12 25 36.235	3.0180	+.0036	+21 21 0.23	19.956
δ Corvi . . .	3.1	A0	12 25 37.167	+3.1016	-.0140	-16 3 32.55	-20.069
γ Crucis . . .	1.6	Mb	12 26 36.333	3.3051	-.0028	-56 39 14.41	20.171
8 Canum Venaticorum . . .	4.3	G0	12 29 51.194	2.8558	-.0617	+41 48 10.22	19.596
κ Draconis . . .	3.9	B5p	12 29 59.501	2.5761	-.0112	+70 14 24.39	19.864
β Corvi . . .	2.8	G5	12 30 4.551	3.1459	-.0008	-22 56 36.34	19.934
24 Comæ seq. . .	5.2	K0	12 31 1.042	+3.0105	-.0007	+18 49 41.66	-19.849
α Muscæ . . .	2.9	B3	12 32 16.617	3.5446	-.0088	-68 41 2.05	19.876
χ Virginis . . .	4.8	K0	12 35 0.730	3.0940	-.0056	- 7 32 40.18	19.843
γ Centauri . . .	2.4	A0	12 36 59.248	3.2959	-.0196	-48 30 34.89	19.804
γ Virginis (mean) . . .	2.9	F0	12 37 30.329	3.0399	-.0365	- 0 59 59.39	19.774
ρ Virginis . . .	5.0	A0	12 37 44.086	+3.0372	+.0058	+10 41 14.00	-19.881
76 Ursæ Majoris . . .	5.9	A0	12 37 59.283	2.6303	-.0065	+63 9 47.10	19.789
β Crucis . . .	1.5	B1	12 42 55.130	3.4843	-.0064	-59 14 26.87	19.728
31 Comæ . . .	5.1	G0	12 47 42.331	2.9237	-.0022	+27 59 11.88	19.637
n Centauri . . .	4.3	A5	12 48 53.375	3.3138	+.0090	-39 43 59.39	19.626
ϵ Ursæ Majoris (Alioth) . . .	1.7	A0p	12 50 25.584	+2.6474	+.0138	+56 24 16.89	-19.575
δ Virginis . . .	3.7	Ma	12 51 28.329	3.0209	-.0318	+ 3 50 34.19	19.602
α Canum Venat. seq. . .	2.9	A0p	12 52 11.666	2.8102	-.0203	+38 45 39.51	19.479
δ Muscæ . . .	3.6	K2	12 56 36.333	4.0770	+.0496	-71 6 24.63	19.468
ϵ Virginis . . .	3.0	K0	12 58 5.700	2.9865	-.0186	+11 23 58.57	19.390
η Virginis . . .	4.4	A0	13 5 42.139	+3.1035	-.0029	- 5 6 5.53	-19.267
43 Comæ . . .	4.3	G0	13 8 2.921	2.8023	-.0599	+28 17 36.76	18.290
20 Canum Venaticorum . . .	4.7	F0	13 13 52.143	2.6952	-.0094	+41 0 14.61	18.998
γ Hydræ . . .	3.3	G5	13 14 27.594	3.2560	+.0046	-22 44 21.25	19.049
ι Centauri . . .	2.9	A2	13 15 58.828	3.3626	-.0294	-36 16 48.45	19.050
ζ^1 Ursæ Maj. (Mizar) . . .	2.4	A0p	13 20 37.671	+2.4216	+.0153	+55 21 11.83	-18.847
ζ^2 Ursæ Majoris . . .	4.0	A0	$\Delta\alpha$ +0.917	....	....	$\Delta\delta$ -12.41	....
α Virginis (Spica) . . .	1.2	B2	13 20 52.247	3.1574	-.0028	-10 44 1.04	18.843
Groombridge 2001 . . .	6.1	K5	13 24 2.440	1.5245	+.0012	+72 49 1.17	18.731
70 Virginis . . .	5.2	G5	13 24 25.161	2.9340	-.0168	+14 12 58.94	19.285
ζ Virginis . . .	3.4	A2	13 30 30.789	+3.0547	-.0195	- 0 10 37.23	-18.463
17 H. Canum Venaticorum . . .	5.0	F0	13 31 8.254	2.6814	+.0073	+37 36 8.06	18.485
ϵ Centauri . . .	2.6	B1	13 34 40.910	3.7820	-.0039	-53 3 0.30	18.398
m Virginis . . .	5.2	Ma	13 37 18.346	3.1455	-.0073	- 8 17 22.79	18.233
τ Boëtis . . .	4.5	F5	13 43 21.922	2.8508	-.0341	+17 51 53.77	18.015
η Ursæ Majoris (Alkaid) . . .	1.9	B3	13 44 18.709	+2.3677	-.0118	+49 43 19.54	-18.027
89 Virginis . . .	5.1	K0	13 45 24.741	3.2546	-.0077	-17 43 34.12	18.003
ζ Centauri . . .	3.1	B2p	13 50 24.950	3.7270	-.0070	-46 53 7.22	17.827
η Boëtis . . .	2.8	G0	13 50 46.825	2.8567	-.0044	+18 48 29.86	18.112
θ Apodis . . .	var.	Mb	13 57 17.447	5.7489	-.0293	-76 24 6.33	17.506
11 Boëtis . . .	6.1	A3	13 57 27.450	+2.7215	-.0090	+27 46 55.56	-17.465
τ Virginis . . .	4.3	A2	13 57 28.319	3.0515	+.0010	+ 1 56 27.06	17.498
β Centauri . . .	0.9	B1	13 58 1.440	4.2083	-.0033	-59 58 41.00	17.478
π Hydræ . . .	3.5	K0	14 1 41.854	3.4101	+.0031	-26 17 16.61	17.431
θ Centauri . . .	2.3	K0	14 1 51.039	3.5206	-.0437	-35 58 1.64	17.803
α Draconis . . .	3.6	A0	14 2 10.178	+1.6246	-.0071	+64 46 2.76	-17.253
d Boëtis . . .	4.8	F5	14 6 39.601	2.7370	-.0014	+25 28 46.16	17.139
κ Virginis . . .	4.3	K0	14 8 31.152	+3.1972	+.0006	- 9 53 33.43	16.843
4 Ursæ Minoris . . .	5.0	K0	14 9 8.773	-0.2771	-.0108	+77 55 57.96	16.921
ι Virginis . . .	4.2	F5	14 11 42.735	+3.1428	-.0013	- 5 36 35.07	17.252
α Boëtis (Arcturus) . . .	0.2	K0	14 11 55.236	+2.7356	-.0779	+19 36 31.57	-18.819
λ Boëtis . . .	4.3	A0	14 13 16.088	+2.2830	-.0172	+46 27 51.66	-16.600

δ Corvi, star 8^m 21" 4 s. pr.
 γ Crucis, star 6^m 6. 85" n. l.
 24 Comæ, star 6^m 7. 20" 6 pr.
 γ Cent., dup., 3^m 1, 3^m 1, 1" 7

γ Virginis, binary, 3^m 7, 3^m 7, 6" 2,
 P = 328"
 α Can. Ven., star 5^m 19' 8 s. pr.
 ϵ Virginis, comp. 9^m, 7" 1 n. pr.

ζ^1 Urs. Maj., star Alcor 4^m 0,
 22" n.
 θ Apodis, var. irreg., 5^m 5-6^m

MEAN PLACES OF TEN-DAY STARS, 1918. 225

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect- rum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	" ' "	" "	" "
λ Virginis	4.6	A2	14 14 40.153	+3.2412	-.0024	-12 59 39.37	-16.662	+0.021
2 Libræ	6.3	K0	14 19 0.702	3.2241	-.0014	-11 20 24.43	16.336	-0.067
θ Boötis	4.1	F8	14 22 24.373	2.0433	-.0254	+52 13 45.49	16.704	-0.405
f Boötis	5.4	A5	14 22 38.493	2.7901	-.0052	+19 35 41.84	16.272	+0.015
φ Virginis	5.0	K0	14 23 58.548	+3.0892	-.0090	-1 51 39.37	16.222	-0.004
5 Ursæ Minoris	4.4	K2	14 27 40.819	-0.1593	+0.0022	+76 3 38.13	-16.004	+0.021
ρ Boötis	3.8	K0	14 28 17.794	+2.5864	-.0073	+30 43 50.85	15.880	+0.114
γ Boötis	3.0	F0	14 28 46.617	2.4171	-.0091	+38 39 59.08	15.823	+0.145
η Centauri	2.6	B3p	14 30 17.622	3.7981	-.0032	-41 47 53.84	15.919	-0.032
σ Boötis	4.5	F0	14 31 6.649	2.6131	+0.0150	+30 6 2.88	15.719	+0.125
α Centauri	0.1	G0	14 34 1.109	+4.0569	-.4862	-60 29 51.67	-14.964	+0.723
33 Boötis	5.4	A0	14 35 47.203	2.2341	-.0056	+44 45 27.90	15.633	-0.043
α Apodis	3.8	K5	14 37 36.274	7.3082	-.0088	-78 41 52.99	15.513	-0.024
μ Virginis	4.0	F5	14 38 44.209	3.1590	+0.0071	-5 18 8.54	15.748	-0.322
ε Boötis	2.7	K0p	14 41 24.355	2.6203	-.0035	+27 25 9.30	15.267	+0.000
109 Virginis	3.8	A0	14 42 6.118	+3.0314	-.0074	+2 14 15.90	-15.272	-0.035
8 Libræ	5.3	F5	14 46 8.875	3.3137	-.0073	-15 39 25.12	15.078	-0.074
α Libræ	2.9	A2	14 46 20.322	3.3142	-.0078	-15 42 6.28	15.070	-0.077
Groombridge 2164	5.7	K2	14 49 21.444	+1.5204	-.0165	+59 37 36.52	14.699	+0.118
β Ursæ Minoris	2.2	K5	14 50 55.858	-0.2016	-.0065	+74 29 26.09	14.721	+0.003
ξ ² Libræ	5.6	K0	14 52 18.931	+3.2508	-.0006	-11 4 46.17	-14.642	-0.001
Piazz 221	5.8	A0	14 52 20.923	2.8298	-.0021	+14 46 37.18	14.650	-0.011
β Lupi	2.8	B2p	14 53 9.093	3.9143	-.0070	-42 48 16.71	14.654	-0.062
δ Libræ	var.	A0	14 56 35.295	3.2016	-.0051	-8 11 39.53	14.399	-0.015
β Boötis	3.6	G5	14 58 51.442	2.2600	-.0036	+40 42 48.16	14.285	-0.040
γ Scorpii	3.4	Ma.	14 59 16.017	+3.5055	-.0056	-24 57 37.46	-14.267	-0.048
ψ Boötis	4.7	K0	15 0 55.905	2.5704	-.0133	+27 16 0.10	14.130	-0.014
c Boötis	5.0	F0	15 3 41.961	2.6347	+0.0136	+25 11 15.97	14.128	-0.184
ζ Lupi	3.5	K0	15 6 23.112	4.2934	-.0126	-51 47 16.48	13.840	-0.066
ι Libræ	4.7	A0p	15 7 32.607	3.4147	-.0031	-19 28 56.34	13.753	-0.053
3 Serpentis	5.4	K0	15 11 6.687	+2.9802	-.0017	+5 14 34.92	-13.475	-0.005
γ Trianguli Australis	3.1	A0	15 11 13.917	5.5568	-.0137	-68 22 40.68	13.804	-0.042
δ Boötis	3.5	K0	15 12 11.825	2.4193	+0.0075	+33 37 12.06	13.525	-0.125
β Libræ	2.7	B8	15 12 35.518	+3.2282	-.0066	-9 4 52.13	13.398	-0.024
γ Ursæ Minoris	3.1	A2	15 20 50.946	-0.1135	-.0020	+72 7 32.68	12.815	+0.013
μ Boötis pr.	4.5	F0	15 21 23.562	+2.2664	-.0121	+37 39 50.80	-12.710	+0.081
τ Serpentis	5.5	Ma	15 21 59.103	2.7801	-.0024	+15 42 55.98	12.775	-0.024
ι Draconis	3.5	K0	15 23 6.326	1.3338	+0.0014	+59 15 10.30	12.666	+0.010
32 Libræ	5.9	K0	15 23 37.733	3.3792	+0.0006	-16 25 53.38	12.683	-0.043
β Coronæ Borealis	3.7	Fp	15 24 26.896	2.4739	-.0130	+29 23 15.59	12.506	+0.078
ν ¹ Boötis	5.2	K5	15 27 59.037	+2.1552	+0.0016	+41 6 42.99	-12.356	-0.014
γ Lupi (mean)	3.0	B3	15 29 40.217	3.9878	-.0020	-40 53 32.30	12.275	-0.049
γ Libræ	4.0	K0	15 30 56.209	3.3528	+0.0047	-14 31 0.44	12.131	+0.006
α Coronæ Borealis	2.3	A0	15 31 12.931	2.5395	+0.0090	+26 59 23.59	12.218	-0.100
ζ Coronæ Borealis seq. †	5.1	B8	15 36 17.411	2.2596	-.0005	+36 54 4.95	11.774	-0.012
α Serpentis	2.8	K0	15 40 13.655	+2.9532	+0.0080	+6 40 58.05	-11.439	+0.042
β Serpentis	3.7	A2	15 42 24.182	2.7686	+0.0054	+15 40 39.29	11.380	-0.055
κ Serpentis	4.3	K5	15 45 2.863	2.6996	-.0035	+18 23 38.11	11.233	-0.099
μ Serpentis	3.6	A0	15 45 20.334	3.1287	-.0058	-3 10 48.52	11.140	-0.028
12 H. Draconis	5.1	A2	15 45 24.776	0.9079	+0.0047	+62 51 9.48	11.175	-0.068
ε Serpentis	3.8	A0	15 46 43.613	+2.9885	+0.0081	+4 43 25.91	-10.941	+0.070
ζ Ursæ Minoris	4.3	A2	15 46 57.492	-2.1977	+0.0082	+78 2 50.37	10.997	-0.004
β Trianguli Australis	3.0	F0	15 47 54.265	+3.2598	-.0290	-63 10 44.26	11.332	-0.408
λ Libræ	5.1	B3	15 48 34.228	3.4778	-.0017	-19 55 22.94	10.922	-0.046
γ Serpentis	3.9	F8	15 52 39.876	2.7699	+0.0212	+15 55 42.38	11.862	-1.289
π Scorpii	3.0	B2p	15 53 53.266	+3.6243	-.0010	-25 52 44.63	-10.530	-0.048
ε Coronæ Borealis	4.2	K0	15 54 11.491	+2.4824	-.0065	+27 6 52.38	-10.527	-0.067

† Virginis, comp. 0^m.4, 4^s.5 s. l.
 † Boötis, comp. 5^m.1, 2^s.8 n. pr.

δ Libræ, var., 2^d.33, 4^m.8-0.2
 μ Boötis, star 6^m.7, 10^s.8 s.

γ Lupi, binary, 3^m.7, 3^s.0, 0^u.4
 ζ Cor. Bor., comp. 6^m.0, 8^s.2 n. pr.

α Centauri, dup., 0^m.3, 1^m.7; companion s. pr. The position given is that of the center of gravity of the system.
 Corrections given on page x remain to be applied to reduce to the position of α Centauri.

226 MEAN PLACES OF TEN-DAY STARS, 1918.

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	" ' "	" "	" "
δ Scorpii	2.5	B1p	15 55 28.874	+3.5428	-.0011	-22 23 21.59	-10.398	-0.035
θ Draconis	4.1	F8	16 0 21.100	1.1221	-.0391	+58 47 2.13	9.657	+0.339
β Scorpii	2.9	B1	16 0 39.924	3.4839	-.0011	-19 34 55.00	10.000	-0.028
κ Herculis	5.3	G5	16 4 22.342	2.7052	-.0039	+17 15 51.73	9.713	-0.023
Groombridge 2320	5.4	A0	16 6 5.626	0.1540	-.0074	+68 1 33.49	9.506	+0.052
φ Herculis	4.3	A0	16 6 11.154	+1.8899	-.0017	+45 8 57.61	-9.514	+0.036
δ ¹ Apodis	4.8	Mb	16 8 2.583	8.8636	-.0050	-78 29 29.89	9.463	-0.056
δ Ophiuchi	3.0	Ma	16 10 2.798	3.1417	-.0031	-3 29 2.61	9.396	-0.144
σ Coronæ Bor. seq.	5.8	G0	16 11 36.434	+2.2459	-.0223	+34 3 57.19	9.203	-0.071
19 Ursæ Minoris	5.5	B8	16 13 8.672	-1.7446	+0.0007	+76 5 4.08	9.003	+0.008
γ ² Normæ	4.1	K0	16 13 41.667	+4.4732	-.0216	-49 57 20.31	-9.032	-0.064
ε Ophiuchi	3.3	K0	16 13 58.842	3.1721	+0.0054	-4 29 36.74	8.909	+0.037
σ Scorpii	3.1	B1	16 16 12.063	3.6420	-.0011	-25 23 49.64	8.810	-0.039
τ Herculis	3.9	B5	16 17 16.559	1.8033	+0.0001	+46 30 28.79	8.658	+0.029
γ Herculis	3.8	F0	16 18 18.122	+2.6456	-.0034	+19 20 41.30	8.569	+0.037
γ Ursæ Minoris	5.0	F0	16 19 52.953	-1.7871	-.0231	+75 56 41.32	-8.229	+0.252
γ Apodis	3.9	K0	16 20 49.734	+9.1119	-.0408	-78 42 55.93	8.488	-0.083
ω Herculis	4.5	Ap	16 21 37.607	2.7620	-.0028	+14 13 16.38	8.402	-0.059
γ Draconis	2.9	G5	16 22 52.699	0.8084	-.0020	+61 41 58.27	8.185	+0.058
α Scorpii (Antares)	1.2	Map	16 24 22.597	3.6746	-.0006	-26 15 3.91	8.151	-0.028
β Herculis	2.8	K0	16 26 41.609	+2.5775	-.0076	+21 40 2.54	-7.962	-0.025
λ Ophiuchi	3.8	A0	16 26 46.578	+3.0241	-.0022	+2 9 44.93	8.009	-0.079
α Draconis	5.0	B8p	16 28 8.196	-0.1284	-.0048	+68 56 44.05	7.786	+0.038
τ Scorpii	2.9	B0	16 30 46.472	+3.7301	-.0013	-28 2 49.29	7.642	-0.034
σ Herculis	4.2	A0	16 31 27.549	1.9336	-.0006	+42 36 19.28	7.527	+0.026
ζ Ophiuchi	2.7	B0	16 32 38.495	+3.3011	+0.0007	-10 24 7.11	-7.435	+0.022
24 Scorpii	5.0	K0	16 36 49.686	3.4668	-.0017	-17 35 3.93	7.120	-0.004
ζ Herculis	3.0	G0	16 38 11.679	2.2614	-.0364	+31 45 2.27	6.614	+0.390
α Trianguli Australis	1.9	K2	16 39 58.081	6.3262	+0.0028	-68 52 44.38	6.908	-0.049
η Herculis	3.6	K0	16 40 5.040	2.0559	+0.0031	+39 4 38.82	6.942	-0.093
Groombridge 2377	4.9	F0	16 43 44.483	+1.1376	+0.0046	+56 55 41.02	-6.486	+0.063
ε Scorpii	2.4	K0	16 44 50.908	3.8802	-.0505	-34 8 44.44	6.720	-0.264
49 Herculis	6.4	A0	16 48 20.814	2.7303	+0.0010	+15 6 38.91	6.179	-0.014
ε ¹ Aræ	4.2	K2	16 53 2.520	4.7721	-.0011	-53 2 9.75	5.790	-0.017
κ Ophiuchi	3.4	K0	16 53 47.153	2.8383	-.0199	+9 30 5.68	5.722	-0.011
30 Ophiuchi	5.0	K0	16 56 44.162	+3.1631	-.0018	+4 6 2.11	-5.539	-0.076
ε Herculis	3.9	A0	16 57 9.100	2.2947	-.0036	+31 2 46.90	5.405	+0.023
d Herculis	5.3	A2	16 58 34.628	2.2121	-.0016	+33 41 10.17	5.317	-0.009
η Ophiuchi	2.6	A0	17 5 40.388	3.4377	+0.0017	-15 37 27.86	4.616	+0.091
γ Scorpii	3.4	F2	17 6 16.612	4.2927	+0.0023	-43 7 57.11	4.962	-0.305
ζ Draconis	3.2	B5	17 8 32.813	+0.1695	-.0021	+65 48 55.83	-4.445	+0.013
α Herculis	var.	Mb	17 10 54.465	2.7346	-.0008	+14 28 58.23	4.231	+0.029
δ Herculis	3.2	A0	17 11 39.759	2.4632	-.0019	+24 56 6.25	4.355	-0.153
π Herculis	3.4	K2	17 12 11.404	2.0885	-.0025	+36 54 2.99	4.152	-0.001
θ Ophiuchi	3.4	B3	17 16 58.302	3.6826	-.0006	-24 55 7.91	3.777	-0.036
w Herculis	5.4	G0	17 17 35.409	+2.2431	+0.0096	+32 34 20.55	-4.735	-1.047
β Aræ	2.8	K2	17 18 28.806	4.9816	-.0004	-55 27 13.43	3.639	-0.027
b Ophiuchi	4.3	F0	17 21 21.609	3.6611	-.0009	-24 6 4.18	3.501	-0.137
σ Ophiuchi	4.4	K0	17 22 26.729	2.9758	+0.0002	+4 12 38.63	3.262	+0.008
δ Aræ	3.8	B8	17 23 41.444	5.4065	-.0098	-60 37 2.34	3.283	-0.120
α Aræ	3.0	B3p	17 25 30.006	+4.6333	-.0036	-49 48 45.30	-3.090	-0.083
λ Herculis	4.5	K0	17 27 25.446	2.4241	+0.0016	+26 10 17.94	2.821	+0.013
λ Scorpii	1.7	B2	17 28 2.304	4.0712	-.0004	-37 2 42.42	2.814	-0.027
β Draconis	3.0	G0	17 28 34.747	1.3544	-.0017	+52 21 41.73	2.731	+0.009
α Ophiuchi	2.1	A5	17 31 7.641	2.7838	+0.0080	+12 37 7.38	2.754	-0.235
ε Serpentiæ	3.6	A5	17 32 53.375	+3.4331	-.0038	-15 20 52.42	-2.426	-0.060
z Herculis	3.8	B3	17 37 9.020	+1.6936	+0.0003	+46 2 57.82	-1.992	+0.003

β Scorpii, comp. 5^m.1, 13^m.3 n. f.
 ε Herculis, star 6^m.5, 20^m.7 n. f.
 σ Cor. Bor., comp. 6^m.7, 4^m.6 s. pr.
 ε Scorpii, star 8^m.21^m pr.
 γ Draconis, comp. 8^m.5, 5^m.4 s. f.

α Scorpii, comp. 7^m.3, 3^m.2 pr.
 λ Ophiuchi, comp. 6^m.1, 1^m.2 n. f.
 ζ Herculis, binary, 3^m.0, 0^m.0, 1^m.
 η Oph., binary, 3^m.2, 3^m.7, 0^m.5

α Herculis, var. irreg., 3^m.1-3^m.9,
 dup., comp. 6^m.4, 4^m.6 s. f.
 δ Herculis, binary, comp. 8^m, 12^m
 s. pr.

MEAN PLACES OF TEN-DAY STARS, 1918. 227

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	" ' "	"	"
sonis	4.9	F5	17 37 25.786	-0.3539	+0.0014	+68 47 45.37	-1.653	+0.318
onis	3.6	K0	17 37 40.801	+5.8818	-.0028	-64 41 11.09	2.029	-0.080
iuchi	2.9	K0	17 39 25.276	2.9630	-.0026	+ 4 36 2.16	1.640	+0.158
pii	3.1	F5p	17 41 50.947	4.1949	+0.0006	-40 5 47.32	1.594	-0.008
culis	3.5	G5	17 43 14.920	+2.3472	-.0238	+27 46 4.21	2.213	-0.749
sonis	4.9	F5	17 43 23.585	-1.0736	+0.0024	+72 11 21.97	-1.719	-0.268
iuchi	3.7	A0	17 43 46.820	+3.0073	-.0016	+ 2 44 13.88	1.490	-0.073
sonis	3.9	K0	17 52 6.722	1.0381	+0.0130	+56 53 6.63	0.613	+0.077
culis	5.5	F2	17 52 6.731	+2.4208	+0.0013	+26 3 41.07	0.684	+0.006
sonis	5.0	F5	17 53 7.109	-2.6898	+0.0116	+76 58 28.36	0.359	+0.243
culis	4.0	K0	17 53 26.434	+2.0571	+0.0006	+37 15 38.34	-0.569	+0.004
iuchi	3.5	K0	17 54 30.696	3.3019	-.0006	- 9 45 52.53	0.600	-0.120
culis	3.8	K0	17 54 34.709	2.3315	+0.0072	+29 15 21.40	0.492	-0.018
sonis	2.4	K5	17 54 42.110	1.3926	-.0006	+51 29 52.87	0.487	-0.024
iuchi	3.9	B5p	17 56 32.307	3.0049	+0.0008	+ 2 56 4.34	0.316	-0.013
sonis	3.9	B1	18 0 14.836	+4.6699	-.0010	-50 5 54.82	-0.029	-0.050
iuchi	3.1	K0	18 0 32.334	3.8520	-.0055	-30 25 34.71	0.151	-0.198
iuchi	4.1	K0	18 1 18.591	3.0317	+0.0178	+ 2 31 2.86	-1.008	-1.122
culis	3.7	A2	18 3 27.691	2.8433	-.0045	+ 9 33 4.80	+0.390	+0.087
culis	3.8	A0	18 4 20.598	2.3395	-.0002	+28 45 1.33	0.382	+0.002
ttarii	4.0	B8p	18 8 51.530	+3.5870	-.0004	-21 4 53.07	+0.773	-0.002
ttarii	3.2	Mb	18 12 4.755	4.0597	-.0109	-36 47 14.24	0.903	-0.152
ombbridge 2533	5.4	B5	18 13 5.714	1.8653	-.0006	+42 7 50.67	1.143	-0.001
sonis	5.0	F5	18 13 25.496	0.3456	+0.0535	+64 22 9.50	1.199	+0.026
ttarii	2.8	K0	18 15 44.663	3.8405	+0.0023	-29 51 51.00	1.342	-0.034
ventis	3.4	K0	18 17 3.950	+3.1028	-.0378	- 2 55 15.65	+0.799	-0.692
ttarii	2.0	A0	18 18 43.736	3.9814	-.0041	-34 25 28.05	1.514	-0.122
culis	3.9	K0	18 20 12.197	2.5560	+0.0139	+21 43 53.07	1.503	-0.261
scopii	3.8	B3	18 20 53.615	+4.4498	-.0017	-46 0 53.93	1.756	-0.068
sonis	3.7	F8	18 22 32.273	-1.0788	+0.1177	+72 41 51.00	1.596	-0.372
ttarii	2.9	K0	18 22 54.814	+3.7027	-.0033	-25 28 5.84	+1.802	-0.199
ventis	5.4	G5	18 25 24.916	3.1215	+0.0015	- 2 2 21.60	2.183	-0.035
ilæ	4.1	K0	18 30 44.684	3.2646	-.0013	- 8 18 8.69	2.366	-0.315
onis	4.1	K0	18 33 27.453	7.0186	-.0057	-71 30 1.45	2.752	-0.165
æ (Vega)	0.1	A0	18 34 9.726	2.0314	+0.0178	+38 42 23.86	3.257	+0.280
ilæ	4.7	F0	18 37 47.104	+3.2866	+0.0020	- 9 7 55.37	+3.284	-0.006
ttarii	3.3	B8	18 40 32.013	3.7486	+0.0034	-27 4 34.28	3.521	-0.006
culis	4.3	F5	18 42 7.901	2.5804	-.0019	+20 28 0.84	3.321	-0.344
ilæ	4.5	G0	18 42 49.414	3.1829	-.0009	- 4 50 11.87	3.701	-0.023
onis	4.4	B2	18 44 37.352	5.5652	-.0030	-62 16 59.19	3.856	-0.022
æ	† var.	B2p	18 47 3.133	+2.2148	+0.0004	+33 16 0.19	+4.082	-0.005
sonis	5.4	A0	18 49 1.662	-1.9216	-.0031	+75 20 15.42	4.307	+0.051
sonis	† 4.8	K0	18 49 59.618	+0.8880	+0.0116	+59 17 16.11	4.361	+0.023
ttarii	2.1	B3	18 50 10.834	3.7199	-.0003	-26 23 59.38	4.279	-0.075
ventis pr.	† 4.5	A5	18 52 8.564	2.9822	+0.0027	+ 4 5 45.31	4.449	+0.028
æ	† var.	Mb	18 52 50.414	+1.8260	+0.0026	+43 50 14.85	+4.659	+0.078
æ	3.3	A0	18 55 52.541	2.2435	-.0006	+32 34 34.57	4.833	-0.006
ilæ	4.2	K0	18 55 54.023	2.7221	-.0042	+14 57 21.49	4.760	-0.081
ttarii	† 2.7	A2	18 57 23.701	3.8177	-.0024	-29 59 55.32	4.949	-0.019
ilæ	3.0	A0	19 1 38.455	2.7599	-.0008	+13 44 26.35	5.228	-0.099
ilæ	3.6	A0	19 1 53.834	+3.1835	-.0020	- 5 0 22.94	+5.265	-0.083
nae Australis	4.1	A2	19 3 53.640	4.0828	+0.0051	- 38 2 0.94	5.399	-0.118
æ	5.1	B5	19 4 22.561	2.1413	+0.0005	+35 58 15.12	5.551	-0.006
ttarii	3.0	F2	19 4 53.281	3.5687	-.0005	-21 9 18.05	5.564	-0.036
ttarii	4.9	F5	19 10 30.809	3.6799	+0.0025	-25 23 56.92	6.035	-0.035
sonis	3.2	K0	19 12 32.436	+0.0216	+0.0175	+67 31 2.17	+6.327	+0.088
ttarii	5.0	K0	19 12 50.269	+3.5108	-.0015	-19 5 59.63	+6.247	-0.017

is, star 6^m.1, 30^m.4 n. l.
hl, comp. 6^m, 8^m.1 s. l.

β Lyrae, var., 12^d.9, 3^m.4-4^m.1, star
7^m, 46^m s. l.
o Draco, star 7^m.6, 32^m.1 n. pr.

θ Serpentis, star 5^m.4, 23^m.2 s. l.
R Lyrae, var., 46^d.4, 4^m.0-4^m.7
ζ Sag., binary, 3^m.4, 3^m.8, 0^m.5

228 MEAN PLACES OF TEN-DAY STARS, 1918.

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect- rum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
θ Lyrae	4.5	K0	19 13 31.268	+2.0808	-.0015	+37 59 13.51	+ 6.327	+0.006
ω Aquilæ	5.1	A5	19 13 58.052	2.8158	-.0002	+11 26 47.86	6.372	+0.014
κ Cygni	4.0	K0	19 15 12.518	+1.3878	+.0071	+53 13 0.09	6.582	+0.121
τ Draconis	4.6	K0	19 17 8.400	-1.1374	-.0312	+73 12 13.10	6.730	+0.109
δ Aquilæ	3.4	F0	19 21 21.844	+3.0249	+.0168	+ 2 57 1.26	7.049	+0.081
β Cygni	3.2	K0p	19 27 24.845	+2.4189	-.0002	+27 47 11.85	+ 7.452	-0.010
ι Cygni	3.9	A2	19 27 38.349	1.5132	+.0023	+51 33 16.52	7.608	+0.129
μ Aquilæ	4.6	K0	19 30 5.045	2.9312	+.0145	+ 7 12 14.63	7.532	-0.146
h Sagittarii	4.7	B9	19 31 43.112	3.6528	+.0045	-25 3 56.41	7.783	-0.027
κ Aquilæ	5.0	B0	19 32 28.867	3.2287	+.0005	- 7 12 38.27	7.873	+0.002
θ Cygni	4.6	F5	19 34 14.572	+1.6089	-.0024	+50 1 50.32	+ 8.263	+0.230
54 Sagittarii	5.4	K0	19 36 1.605	3.4385	+.0046	-16 28 56.21	8.108	-0.047
β Sagittæ	4.4	K0	19 37 21.937	2.6939	+.0001	+17 17 6.90	8.230	-0.032
15 Cygni	5.0	K0	19 41 19.197	2.1640	+.0068	+37 9 20.62	8.616	+0.040
f Sagittarii	5.1	K0	19 41 34.796	3.5012	-.0099	-19 57 33.05	8.508	-0.083
γ Aquilæ	2.8	K2	19 42 21.669	+2.8519	+.0007	+10 24 45.14	+ 8.655	-0.003
δ Cygni	3.0	A0	19 42 24.773	1.8760	+.0055	+44 55 47.94	8.706	+0.044
δ Sagittæ	3.8	Map	19 43 43.890	2.6748	+.0004	+18 19 52.40	8.783	+0.017
α Aquilæ (Altair)	0.9	A5	19 46 46.951	2.9271	+.0360	+ 8 39 2.97	9.384	+0.379
γ Aquilæ	var.	G0	19 48 17.776	+3.0567	+.0005	+ 0 47 39.46	9.115	-0.003
ε Draconis	4.0	K0	19 48 27.562	-0.1890	+.0170	+70 3 32.56	+ 9.163	+0.027
ι Sagittarii	4.2	K0	19 49 36.354	+4.1424	-.0017	-42 5 5.42	9.270	+0.045
ε Pavonis	4.1	A0	19 51 7.691	6.9823	+.0112	-73 7 42.45	9.224	-0.120
β Aquilæ	3.9	K0	19 51 17.122	2.9467	+.0025	+ 6 12 3.95	8.875	-0.481
γ Sagittæ	3.7	K5	19 55 6.598	2.6673	+.0041	+19 16 7.12	9.675	+0.025
c Sagittarii	4.6	Mb	19 57 37.099	+3.6924	+.0023	-27 56 19.79	+ 9.855	+0.013
τ Aquilæ	5.6	K0	20 0 8.066	2.9307	+.0010	+ 7 2 45.43	10.062	+0.029
θ Aquilæ	3.4	A0	20 7 4.467	3.0958	+.0020	- 1 3 55.92	10.559	+0.006
ο Cygni seq.	4.0	K0p	20 11 3.022	+1.8901	+.0014	+46 29 31.56	10.853	+0.005
κ Cephei	4.4	B9	20 11 40.561	-1.9704	+.0025	+77 27 54.10	10.919	+0.026
24 Vulpeculæ	5.4	K0	20 13 16.576	+2.5674	+.0017	+24 25 4.00	+10.999	-0.012
α ² Capricorni	3.8	K0	20 13 30.376	3.3302	+.0040	-12 47 59.51	11.036	+0.008
β Capricorni	3.2	G0p	20 16 24.373	3.3730	+.0030	-15 2 28.25	11.245	+0.007
α Pavonis	2.1	B3	20 19 10.101	4.7625	-.0000	-56 59 56.52	11.346	-0.002
γ Cygni	2.3	F8p	20 19 17.100	2.1527	+.0004	+39 59 36.92	11.447	+0.001
π Capricorni	5.2	B8	20 22 37.750	+3.4360	+.0004	-18 28 52.61	+11.683	-0.002
ρ Capricorni	5.0	F0	20 24 11.114	3.4243	-.0013	-18 5 8.24	11.775	-0.020
41 Cygni	4.1	F5	20 26 2.750	2.4516	+.0014	+30 5 39.41	11.925	-0.002
θ Cephei	4.3	A5	20 28 12.527	1.0112	+.0066	+62 43 5.30	12.060	-0.018
ε Delphini	4.0	B5	20 29 17.743	+2.8664	+.0007	+11 1 25.53	12.129	-0.025
Groombridge 3241	6.4	K2	20 30 22.282	-0.2407	-.0047	+72 15 14.21	+12.210	-0.018
α Indi	3.2	K0	20 31 48.189	+4.2286	+.0027	-47 34 42.86	12.381	+0.053
β Delphini	3.7	F5	20 33 42.267	2.8138	+.0082	+14 18 32.86	12.423	-0.035
v Capricorni	5.3	Ma	20 35 23.023	3.4177	-.0018	-18 25 40.89	12.566	-0.007
α Delphini	3.9	B8	20 35 49.775	2.7868	+.0047	+15 37 20.23	12.620	+0.017
β Pavonis	3.6	A5	20 37 35.121	+5.4397	-.0079	-66 29 57.18	+12.719	-0.003
α Cygni (Deneb)	1.3	A2p	20 38 38.164	2.0448	+.0004	+44 59 12.18	12.791	-0.002
δ Delphini	4.5	A2	20 39 37.845	2.8008	-.0014	+14 46 46.40	12.810	-0.050
ψ Capricorni	4.3	F8	20 41 14.607	3.5561	-.0041	-25 33 58.37	12.820	-0.148
γ Delphini seq.	4.5	G5	20 42 51.231	2.7832	-.0023	+15 49 41.06	12.879	-0.196
ε Cygni	2.6	K0	20 42 53.597	+2.4276	+.0294	+33 39 44.88	+13.404	+0.326
ε Aquarii	3.8	A0	20 43 14.303	3.2490	+.0017	- 9 47 48.10	13.070	-0.030
η Cephei	3.6	K0	20 43 37.451	1.2241	+.0132	+61 31 11.97	13.946	+0.820
μ Aquarii	4.8	A3	20 48 13.943	3.2375	+.0025	- 9 17 30.79	13.389	-0.039
β Indi	3.7	K0	20 48 24.687	4.7093	+.0018	-58 45 51.55	13.431	-0.008
32 Vulpeculæ	5.2	K2	20 51 3.894	+2.5564	-.0003	+27 44 42.52	+13.615	+0.004

β Cygni, star 5^m.4, 34^m.7 n. f.
 δ Cygni, comp. 8^m, 1^m.6 n. pr.
 γ Aquilæ, var., 7^m.18, 3^m.7-4^m.4
 ε Draconis, comp. 7^m.6, 3^m.1 n.

ο Cygni, star 5^m.0 pr. 19^m, 270^m n.,
 star 7^m.8 f. 1^m, 86^m s.
 κ Cephei, comp. 8^m, 7^m.5 s. f.
 α² Capricorn., α¹ Capricorn. 4^m.6 pr. 24^m,
 137^m n.

β Capricorn., star 6^m.2 pr. 14^m, 10^m s.
 γ Capricorn., comp. 9^m, 3^m.4 s. f.
 ρ Capricorn., comp. 7^m.6, 2^m.8 s.
 δ Delphini, binary, 4^m.1, 5^m.4, 0^m.5
 γ Delphini, comp. 5^m.3, 11^m.2 pr.

MEAN PLACES OF TEN-DAY STARS, 1918. 229

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ' "	"	"
0 H ¹ . Draconis	5.6	K0	20 51 21.084	-2.6380	-.0105	+80 14 43.95	+13.604	-0.025
α Cygni	4.0	A0	20 54 6.925	+2.2357	+.0008	+40 51 2.96	13.788	-0.018
α Octantis	5.2	F2	20 54 49.790	7.3720	-.0006	-77 20 17.99	13.461	-0.389
γ Microscopii	4.7	G5	20 56 15.945	3.6858	-.0004	-32 34 44.62	13.937	-0.004
θ Capricorni	4.2	A0	21 1 20.376	3.3750	+.0051	-17 33 34.36	14.190	-0.066
ξ Cygni	3.9	K5	21 1 56.856	+2.1814	+.0009	+43 36 0.97	+14.302	+0.008
η Cygni pr.	5.6	K5	21 3 13.151	2.6854	+.3496	+38 20 43.75	17.621	+3.249
η Cygni seq.	6.3	K5	Δα +1.497	.....	.....	Δδ -15.80	.....	.....
ν Aquarii	4.5	K0	21 5 7.716	+3.2997	+.0057	-11 42 15.54	14.482	-0.006
Bradley 2777	5.9	A	21 7 10.054	-1.1468	+.0102	+77 47 38.75	14.640	+0.029
3 Piscis Australis	5.6	K5	21 8 25.770	+3.5628	+.0075	-27 57 16.27	+14.580	-0.106
ξ Cygni	3.4	K0	21 9 26.728	2.5522	-.0002	+29 53 23.71	14.685	-0.061
τ Cygni	3.8	F0	21 11 31.030	2.3941	+.0141	+37 41 41.41	15.302	+0.434
α Equulei	4.1	F8p	21 11 43.505	2.9992	+.0034	+ 4 54 29.40	14.795	-0.085
σ Cygni	4.3	A0p	21 14 11.656	2.3549	-.0001	+39 3 2.15	15.027	+0.003
θ ¹ Microscopii	4.9	A2p	21 15 31.132	+3.8437	+.0028	-41 9 24.94	+15.106	+0.005
α Cephei	2.6	A5	21 16 37.457	1.4347	+.0224	+62 14 16.14	15.214	+0.050
ι Capricorni	4.3	K0	21 17 40.995	3.3437	+.0022	-17 11 4.09	15.228	+0.004
ι Pegasi	4.2	K0	21 18 17.638	2.7741	+.0075	+19 27 11.02	15.323	+0.064
γ Pavonis	4.3	F8	21 19 40.868	4.9971	+.0154	-65 44 18.14	16.122	+0.784
ξ Capricorni	3.9	G5p	21 21 59.323	+3.4298	+.0004	-22 46 1.92	+15.487	+0.020
g Cygni	5.3	K0	21 26 25.354	2.2129	+.0050	+46 10 42.94	15.816	+0.105
β Aquarii	3.1	G0	21 27 14.602	3.1597	+.0012	- 5 55 57.37	15.745	-0.011
β Cephei	3.3	B1	21 27 36.517	0.7850	+.0026	+70 12 2.00	15.780	+0.005
ξ Aquarii	4.8	A5	21 33 23.285	3.1954	+.0075	- 8 13 21.23	16.059	-0.023
74 Cygni	5.1	A5	21 33 39.695	+2.4036	+.0003	+40 2 40.61	+16.105	+0.009
γ Capricorni	3.8	F0p	21 35 33.003	3.3268	+.0129	-17 1 59.72	16.176	-0.017
ε Pegasi	2.5	K0	21 40 9.499	2.9461	+.0016	+ 9 29 54.41	16.428	0.000
η Cephei	4.8	K0	21 40 43.503	0.8871	+.0221	+70 56 1.05	16.550	+0.093
δ Capricorni	3.0	A5	21 42 31.012	3.3137	+.0176	-16 30 0.02	16.248	-0.297
α ² Cygni	4.3	B3	21 43 45.754	+2.2148	+.0009	+48 55 47.04	+16.606	-0.001
μ Capricorni	5.2	F0	21 48 49.614	3.2727	+.0204	-13 56 18.57	16.852	+0.001
γ Gruis	3.2	B8	21 48 58.055	3.6402	+.0077	-37 45 4.35	16.837	-0.021
16 Pegasi	5.0	B3	21 49 19.810	2.7286	+.0005	+25 32 20.09	16.880	+0.006
79 Draconis	6.6	A0	21 51 49.965	0.7174	+.0100	+73 18 51.00	17.007	+0.016
20 Pegasi	5.7	F2	21 57 5.638	+2.9222	+.0038	+12 43 35.72	+17.178	-0.054
ε Indi	4.7	K5	21 57 5.712	4.6074	+.4783	-57 7 24.95	14.659	-2.572
α Aquarii	3.2	G0	22 1 34.377	3.0819	+.0010	- 0 43 7.19	17.426	-0.002
ι Aquarii	4.4	B8	22 2 0.605	3.2422	+.0022	-14 16 5.01	17.385	-0.062
20 Cephei	5.4	K5	22 2 30.944	1.8229	+.0032	+62 23 6.71	17.520	+0.051
α Gruis	2.2	B5	22 3 4.269	+3.7923	+.0110	-47 21 32.11	+17.318	-0.174
ι Pegasi	4.0	F5	22 3 11.569	2.7916	+.0222	+24 56 38.71	17.518	+0.020
θ Pegasi	3.7	A0	22 6 3.832	3.0267	+.0187	+ 5 47 38.49	17.654	+0.036
π Pegasi	4.4	F5	22 6 20.659	2.6629	-.0003	+32 46 31.47	17.612	-0.018
ξ Cephei	3.6	K0	22 8 0.444	2.0784	+.0018	+57 47 48.36	17.710	+0.010
24 Cephei	5.0	G5	22 8 14.042	+1.1370	+.0044	+71 56 13.33	+17.712	+0.004
θ Aquarii	4.3	K0	22 12 30.462	3.1670	+.0074	- 8 11 31.27	17.862	-0.019
α Tucanæ	2.9	K2	22 12 53.628	4.1323	-.0118	-60 40 7.19	17.861	-0.035
γ Aquarii	4.0	A0	22 17 25.284	3.0990	+.0081	- 1 48 3.14	18.086	+0.015
31 Pegasi	4.9	B3p	22 17 28.913	2.9530	+.0010	+11 47 29.58	18.080	+0.007
3 Lacertæ	4.6	K0	22 20 19.992	+2.3561	-.0007	+51 49 4.36	+17.991	-0.188
π Aquarii	4.6	B1	22 21 5.355	3.0637	+.0004	+ 0 57 38.90	18.206	-0.001
σ Aquarii	4.9	A0	22 26 18.567	3.1768	-.0000	-11 5 52.50	18.368	-0.026
α Lacertæ	3.8	A0	22 27 54.668	2.4686	+.0157	+49 51 37.89	18.462	+0.014
ν Aquarii	5.3	F5	22 30 12.584	3.2846	+.0148	-21 7 43.72	18.372	-0.154
26 B. Cephei	5.7	A0	22 30 50.296	+1.0638	-.0052	+75 48 13.56	+18.547	0.000

Cygni, comp. 7^m, 0^s.8

γ Cygni, star 6^m.7 f. 10^s, 420^s. s.

β Cephei, star 8^m, 13^s.3 s. pr.

230 MEAN PLACES OF TEN-DAY STARS, 1918.

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.
			h m s	s	s	" ' "	"
η Aquarii	4.1	B8	22 31 8.587	+3.0831	+0.0057	- 0 32 25.79	+18.50
10 Lacertæ	4.9	Oe5	22 35 34.792	2.6894	+0.0011	+38 37 23.13	18.68
ε Piscis Australis	4.2	B8	22 36 7.368	3.3221	+0.0008	-27 28 18.80	18.70
ζ Pegasi	3.6	B8	22 37 22.317	2.9915	+0.0054	+10 24 10.41	18.74
β Gruis	2.2	Mb	22 37 46.634	3.5947	+0.0133	-47 18 50.23	18.74
η Pegasi	3.1	G0	22 39 9.375	+2.8095	+0.0011	+29 47 30.83	+18.77
λ Pegasi	4.1	K0	22 42 34.770	2.8872	+0.0037	+23 8 1.68	18.90
ε Gruis	3.7	A2	22 43 36.472	3.6366	+0.0093	-51 44 53.89	18.88
τ Aquarii	4.2	K5	22 45 15.136	3.1788	-0.0008	-14 1 32.47	18.95
μ Pegasi	3.7	K0	22 46 2.642	2.8935	+0.0110	+24 10 5.80	18.90
ι Cephei	3.7	K0	22 46 45.438	+2.1288	-0.0111	+65 46 7.88	+18.90
λ Aquarii	3.8	Ma	22 48 20.243	3.1307	+0.0002	- 8 0 58.59	19.10
ρ Indi	6.1	G5	22 48 58.162	4.2111	-0.0133	-70 30 43.88	19.14
δ Aquarii	3.5	A2	22 50 17.993	3.1859	-0.0034	-16 15 26.01	19.10
α Pisc. Aust. (<i>Fomalhaut</i>)	1.3	A3	22 53 7.370	3.3203	+0.0252	-30 3 25.96	19.02
σ Andromedæ	3.6	B5p	22 58 8.671	+2.7551	+0.0020	+41 53 6.01	+19.31
β Pegasi	var. \dagger	Ma	22 59 47.813	2.9056	+0.0146	+27 38 15.72	19.49
α Pegasi (<i>Markab</i>)	2.6	A0	23 0 40.489	2.9865	+0.0040	+14 45 49.75	19.33
55 Pegasi	4.7	Ma	23 2 52.363	3.0210	+0.0003	+ 8 57 58.38	19.41
ϵ^2 Aquarii	3.8	K0	23 5 4.578	3.2016	+0.0032	-21 37 4.13	19.51
π Cephei	\dagger 4.6	G5	23 5 17.134	+1.9002	+0.0023	+74 56 38.52	+19.44
ι Gruis	4.1	K0	23 5 43.328	3.4060	+0.0121	-45 41 28.24	19.45
59 Pegasi	5.2	A3	23 7 35.748	3.0279	-0.0007	+ 8 16 28.70	19.52
5 H ^c . Cassiopeiæ	5.6	K2	23 9 19.776	2.8799	+0.0236	+56 42 55.84	19.85
ϕ Aquarii	4.4	Ma	23 10 4.557	3.1070	+0.0015	- 6 29 28.69	19.37
ψ Aquarii	\dagger 4.5	K0	23 11 35.811	+3.1447	+0.0250	- 9 32 4.39	+19.59
γ Tucanæ	4.1	F2	23 12 39.069	3.5176	-0.0057	-58 41 9.08	19.67
γ Piscium	3.8	K0	23 12 54.841	3.1094	+0.0502	+ 2 50 2.59	19.64
γ Sculptoris	4.5	K0	23 14 23.928	3.2442	+0.0002	-32 58 44.30	19.58
σ Cephei	\dagger 4.9	G5	23 15 15.123	2.4530	+0.0113	+67 39 45.75	19.68
τ Pegasi	4.6	A5	23 16 34.552	+2.9661	+0.0018	+23 17 28.54	+19.67
b^1 Aquarii	4.2	K0	23 18 39.914	3.1527	-0.0099	-20 32 54.44	19.63
4 Cassiopeiæ	5.2	K5	23 21 11.244	2.6516	-0.0004	+61 49 56.94	19.74
v Pegasi	4.6	G0	23 21 17.058	2.9909	+0.0134	+22 57 8.72	19.79
κ Piscium	4.9	A2p	23 22 43.734	3.0752	+0.0056	+ 0 48 23.75	19.68
θ Piscium	4.4	G5	23 23 48.460	+3.0421	-0.0088	+ 5 55 42.50	+19.75
70 Pegasi	4.7	K0	23 25 0.371	3.0323	+0.0040	+12 18 28.95	19.84
β Sculptoris	4.5	B9	23 28 34.680	3.2229	+0.0071	-38 16 19.54	19.86
72 Pegasi (<i>mean</i>)	\dagger 5.2	K2	23 29 52.900	2.9714	+0.0035	+30 52 21.72	19.86
λ Andromedæ	4.0	K0	23 33 32.758	2.9290	+0.0158	+46 0 49.71	19.49
ι Andromedæ	4.3	B8	23 34 6.603	+2.9356	+0.0025	+42 48 50.48	+19.91
ι Piscium	4.3	G0	23 35 43.910	3.0845	+0.0246	+ 5 10 54.27	19.49
γ Cephei	3.4	K0	23 35 58.299	2.4411	-0.0173	+77 10 28.92	20.06
κ Andromedæ	4.3	A0	23 36 21.882	2.9482	+0.0078	+43 52 47.05	19.91
ω^2 Aquarii	4.6	A0	23 38 28.256	3.1125	+0.0063	-14 59 53.87	19.89
ι^1 Aquarii	5.3	B8	23 39 57.011	+3.1142	+0.0019	-18 43 55.96	+19.96
ψ Andromedæ	5.1	K0	23 41 57.931	2.9646	+0.0005	+45 57 53.57	19.97
41 H. Cephei	5.0	A0	23 43 58.822	2.8514	+0.0024	+67 21 3.88	19.98
δ Sculptoris	4.6	A0	23 44 39.368	3.1273	+0.0059	-28 35 3.01	19.86
ϕ Pegasi	5.2	Ma	23 48 18.829	3.0484	-0.0013	+18 39 53.38	19.98
ρ Cassiopeiæ	4.8	F8p	23 50 16.694	+2.9830	-0.0022	+57 2 35.51	+20.02
Groombridge 4163	6.6	B9	23 50 49.347	2.8827	-0.0040	+73 57 14.25	20.02
ω Piscium	4.0	F5	23 55 5.977	3.0797	+0.0102	+ 6 24 33.85	19.93
ε Tucanæ	4.7	B9	23 55 39.879	3.1371	+0.0076	-66 1 58.99	20.03
30 Piscium	4.7	Mb	23 57 45.291	3.0771	+0.0030	- 6 28 11.20	20.00
2 Ceti	4.6	A0	23 59 32.414	+3.0750	+0.0015	-17 47 33.19	+20.03

β Pegasi, var. irreg., 2^m.2-2^m.7
 ω Cephei, comp. 7^m, 0^m.9 f.

ψ Aquarii, star 8^m.5, 40^m.4 n. pr.
 σ Cephei, comp. 8^m, 2^m.9 s. pr.

72 Pegasi, binary, 0^m.0, 0^m.0

AN PLACES OF CIRCUMPOLAR STARS, 1918. 231

FOR JANUARY 0^d.459, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
ephei	4.5	K0	0 57 16.959	+ 7.6664	+ .0781	+85 49 4.72	+19.418	-0.004
e Min. (<i>Polaris</i>) . †	2.1	F8	1 30 42.307	+29.2762	+ .1479	+88 52 2.06	+18.496	+0.002
ctantis	5.6	K0	1 41 58.587	- 3.7460	+ .0096	-85 11 3.34	+18.131	+0.028
ombridge 750	6.7	F8	4 10 20.187	+17.6351	+ .0129	+85 20 19.62	+ 9.272	+0.042
ombridge 944	6.4	K0	5 35 31.554	+18.7745	+ .0130	+85 9 32.39	+ 2.132	-0.004
ense	6.2	A0	5 46 3.075	-11.6801	- .0122	-84 49 45.59	+ 1.306	+0.087
ee	5.6	A2	6 46 53.600	- 4.9463	- .0036	-80 43 42.15	- 3.991	+0.082
ephei	5.3	Ma	7 2 33.206	+29.1435	- .0678	+87 10 49.32	- 5.438	-0.038
amelopardalis . . .	5.1	Mb	7 13 55.106	+12.8062	+ .0132	+82 34 23.73	- 6.400	-0.047
ctantis	6.4	F5	7 16 0.004	-20.3004	- .0146	-86 54 13.24	- 6.521	+0.006
ombridge 1119 . . .	7.0	A0	8 16 48.125	+59.5626	- .0400	+88 52 49.08	-11.250	+0.017
ntis	5.4	A3	9 8 49.775	- 8.1718	- .1148	-85 20 12.12	-14.666	+0.043
Draconis	4.6	K0	9 25 30.501	+ 8.7780	- .0059	+81 41 25.82	-15.688	-0.027
nsleonitis	5.2	B3	9 36 20.688	- 1.6605	- .0121	-80 34 23.04	-16.216	+0.019
amelopardalis . . .	5.3	F5	10 21 12.394	+ 7.5589	- .0462	+82 58 35.87	-18.203	+0.009
ntis	6.3	A0	10 59 54.915	- 0.3668	- .0574	-84 9 9.97	-19.365	-0.006
lley 1672	6.3	F0	12 14 28.804	+ 0.3826	- .0715	+88 9 16.14	-19.947	+0.058
ntis	5.4	K0	12 46 13.131	+ 5.9630	+ .0366	-84 40 41.95	-19.615	+0.024
amelop. seq. . . . †	5.3	A2	12 48 30.862	+ 0.4449	- .0184	+83 51 30.88	-19.582	+0.016
ntis	5.6	A2	13 27 23.749	+ 9.1332	- .0764	-85 22 0.86	-18.629	-0.024
ntis	4.1	K2	14 13 37.066	+ 9.2787	- .0511	-83 17 37.78	-16.748	-0.014
ombridge 2283 . . .	7.2	K0	15 3 21.809	-19.3321	- .0067	+87 32 56.60	-13.934	+0.031
ntis	5.7	A2	15 24 9.966	+13.3787	+ .0842	-84 11 42.92	-12.523	+0.080
e Minoris	4.4	G5	16 54 19.238	- 6.2481	+ .0057	+82 10 27.09	- 5.667	-0.001
ipodis	5.9	Mb	17 16 6.064	+11.1891	+ .0096	-80 47 10.43	- 3.855	-0.089
e Minoris	4.4	A0	17 58 41.809	-19.4975	+ .0174	+86 36 51.12	- 0.066	+0.048
ntis	5.2	K0	18 6 47.620	+35.7248	- .0962	-87 39 51.38	+ 0.467	-0.127
e Minoris	6.6	Mb	19 1 27.463	-72.2731	- .1106	+89 1 7.53	+ 5.317	+0.006
ntis	5.5	F0	19 29 16.746	+94.2768	+ .1082	-89 13 21.02	+ 7.613	-0.001
conis	5.7	A0	20 48 36.323	- 4.1738	+ .0131	+82 13 43.34	+13.477	+0.025
ntis †	5.4	G0p	21 38 29.050	+ 9.5028	+ .0388	-83 5 50.66	+16.331	-0.012
ntis	5.7	K0	22 16 20.949	+12.2784	- .0400	-86 23 9.03	+18.104	+0.074
ntis	4.3	F0	22 37 45.323	+ 6.3043	- .0302	-81 48 43.57	+18.770	+0.002
ephei	5.6	F0	23 27 43.851	- 0.2768	+ .0640	+86 51 18.76	+19.867	+0.020
ntis	5.1	G5	23 47 20.032	+ 3.6069	- .0247	-82 28 28.42	+20.003	-0.012

fm., star 9=, 18' s. pr. | 32 H. Camelop., star 5=, 19''.8 s. pr. | λ Octantis, binary, 5=, 5=, 0, 3''.2 n. f.

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Jan.	0 57	+85 49	Jan.	1 30	+88 52	Jan.	1 41	-85 11	Jan.	4 10	+85 20	Jan.	5 35	+85 9
	s	"		s	"		s	"		s	"		s	"
0.3	21.62	31.72	0.3	69.86	28.31	0.3	61.69	16.67	0.4	40.01	34.65	0.5	53.79	38.13
1.3	21.30	31.78	1.3	68.72	28.42	1.3	61.45	16.71	1.4	39.87	34.93	1.5	53.75	38.46
2.3	20.99	31.82	2.3	67.62	28.53	2.3	61.20	16.74	2.4	39.72	35.22	2.4	53.71	38.79
3.3	20.70	31.85	3.3	66.54	28.62	3.3	60.93	16.78	3.4	39.57	35.47	3.4	53.65	39.09
4.3	20.42	31.86	4.3	65.50	28.70	4.3	60.65	16.85	4.4	39.42	35.71	4.4	53.60	39.37
5.3	20.14	31.87	5.3	64.51	28.78	5.3	60.37	16.89	5.4	39.28	35.95	5.4	53.54	39.65
6.2	19.89	31.89	6.3	63.56	28.85	6.3	60.07	16.91	6.4	39.15	36.17	6.4	53.49	39.93
7.2	19.64	31.92	7.3	62.62	28.93	7.3	59.77	16.92	7.4	39.03	36.40	7.4	53.45	40.20
8.2	19.40	31.95	8.3	61.71	29.01	8.3	59.47	16.92	8.4	38.92	36.64	8.4	53.42	40.46
9.2	19.15	32.00	9.3	60.79	29.10	9.3	59.17	16.88	9.4	38.81	36.88	9.4	53.40	40.74
10.2	18.89	32.06	10.3	59.82	29.20	10.3	58.88	16.82	10.4	38.70	37.14	10.4	53.37	41.05
11.2	18.61	32.12	11.3	58.81	29.31	11.3	58.60	16.74	11.4	38.58	37.41	11.4	53.35	41.36
12.2	18.32	32.17	12.3	57.71	29.42	12.3	58.33	16.66	12.4	38.45	37.68	12.4	53.32	41.69
13.2	18.00	32.19	13.2	56.55	29.52	13.3	58.07	16.57	13.4	38.28	37.97	13.4	53.26	42.02
14.2	17.67	32.20	14.2	55.34	29.57	14.3	57.83	16.50	14.4	38.11	38.25	14.4	53.18	42.36
15.2	17.36	32.18	15.2	54.12	29.61	15.3	57.59	16.44	15.4	37.91	38.49	15.4	53.08	42.67
16.2	17.04	32.14	16.2	52.94	29.62	16.2	57.33	16.40	16.4	37.70	38.69	16.4	52.96	42.96
17.2	16.75	32.08	17.2	51.84	29.62	17.2	57.06	16.36	17.4	37.50	38.88	17.4	52.83	43.22
18.2	16.47	32.02	18.2	50.78	29.60	18.2	56.78	16.33	18.3	37.30	39.05	18.4	52.70	43.47
19.2	16.22	31.95	19.2	49.80	29.58	19.2	56.48	16.29	19.3	37.11	39.21	19.4	52.60	43.71
20.2	15.98	31.88	20.2	48.88	29.56	20.2	56.17	16.22	20.3	36.95	39.37	20.4	52.50	43.94
21.2	15.75	31.84	21.2	47.97	29.56	21.2	55.85	16.13	21.3	36.79	39.54	21.4	52.41	44.18
22.2	15.52	31.81	22.2	47.03	29.57	22.2	55.56	16.00	22.3	36.64	39.74	22.4	52.33	44.43
23.2	15.25	31.79	23.2	46.04	29.59	23.2	55.28	15.86	23.3	36.48	39.94	23.4	52.25	44.69
24.2	14.98	31.75	24.2	44.99	29.61	24.2	55.01	15.71	24.3	36.30	40.15	24.4	52.16	44.97
25.2	14.70	31.71	25.2	43.88	29.62	25.2	54.76	15.56	25.3	36.11	40.36	25.4	52.05	45.26
26.2	14.39	31.66	26.2	42.70	29.61	26.2	54.51	15.42	26.3	35.90	40.57	26.4	51.92	45.55
27.2	14.08	31.57	27.2	41.52	29.58	27.2	54.27	15.28	27.3	35.67	40.77	27.4	51.77	45.84
28.2	13.77	31.44	28.2	40.33	29.53	28.2	54.03	15.13	28.3	35.43	40.95	28.4	51.60	46.10
29.2	13.48	31.31	29.2	39.16	29.45	29.2	53.78	15.01	29.3	35.18	41.10	29.4	51.43	46.35
30.2	13.19	31.17	30.2	38.03	29.37	30.2	53.53	14.89	30.3	34.92	41.24	30.4	51.24	46.58
31.2	12.92	31.02	31.2	36.95	29.27	31.2	53.26	14.78	31.3	34.67	41.36	31.4	51.06	46.80
13.74	+13.70		50.93	+50.92		11.92	-11.88		12.32	+12.28		11.86	+11.82	
0 ^h 57 ^m 16 ^s .959			1 ^h 30 ^m 42 ^s .307			1 ^h 41 ^m 58 ^s .587			4 ^h 10 ^m 20 ^s .187			5 ^h 35 ^m 31 ^s .554		
+85° 49' 4".72			+88° 52' 2".06			-85° 11' 3".34			+85° 20' 19".62			+85° 9' 32".39		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensae. Mag. 6.2			♄ Mensae. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "
Jan.	5 46	-84 49	Jan.	6 46	-80 43	Jan.	7 3	+87 10	Jan.	7 14	+82 34	Jan.	7 16	-86 54
	s	"		s	"		s	"		s	"		s	"
0.5	13.67	49.98	0.5	60.32	43.16	0.5	10.97	44.78	0.5	10.00	17.79	0.5	17.74	12.37
1.5	13.59	50.29	1.5	60.30	43.50	1.5	11.07	45.12	1.5	10.06	18.12	1.5	17.74	12.69
2.5	13.50	50.60	2.5	60.29	43.85	2.5	11.16	45.45	2.5	10.10	18.43	2.5	17.74	13.03
3.5	13.40	50.93	3.5	60.28	44.22	3.5	11.21	45.77	3.5	10.14	18.73	3.5	17.75	13.39
4.5	13.30	51.27	4.5	60.27	44.57	4.5	11.26	46.08	4.5	10.17	19.02	4.5	17.75	13.77
5.4	13.20	51.62	5.5	60.24	44.97	5.5	11.32	46.36	5.5	10.21	19.30	5.5	17.73	14.14
6.4	13.07	51.97	6.5	60.21	45.37	6.5	11.40	46.65	6.5	10.24	19.56	6.5	17.70	14.56
7.4	12.94	52.31	7.5	60.19	45.77	7.5	11.48	46.92	7.5	10.28	19.81	7.5	17.66	14.97
8.4	12.80	52.66	8.5	60.16	46.16	8.5	11.56	47.19	8.5	10.32	20.08	8.5	17.58	15.37
9.4	12.63	52.99	9.5	60.11	46.53	9.5	11.66	47.47	9.5	10.38	20.33	9.5	17.49	15.75
10.4	12.46	53.31	10.5	60.06	46.93	10.5	11.77	47.77	10.5	10.44	20.61	10.5	17.35	16.13
11.4	12.29	53.60	11.5	60.00	47.27	11.5	11.89	48.08	11.5	10.51	20.91	11.5	17.21	16.50
12.4	12.12	53.86	12.5	59.95	47.61	12.5	11.99	48.41	12.5	10.57	21.23	12.5	17.06	16.83
13.4	11.96	54.13	13.5	59.89	47.93	13.5	12.08	48.75	13.5	10.62	21.56	13.5	16.92	17.14
14.4	11.81	54.39	14.5	59.84	48.25	14.5	12.12	49.11	14.5	10.65	21.91	14.5	16.78	17.46
15.4	11.66	54.64	15.5	59.79	48.56	15.5	12.12	49.47	15.5	10.65	22.24	15.5	16.65	17.78
16.4	11.51	54.92	16.5	59.73	48.89	16.5	12.07	49.80	16.5	10.65	22.57	16.5	16.55	18.11
17.4	11.35	55.21	17.5	59.68	49.23	17.5	12.01	50.12	17.5	10.64	22.88	17.5	16.45	18.46
18.4	11.19	55.53	18.5	59.63	49.59	18.5	11.94	50.41	18.5	10.62	23.16	18.5	16.33	18.83
19.4	11.02	55.85	19.5	59.58	49.97	19.5	11.88	50.69	19.5	10.60	23.43	19.5	16.21	19.23
20.4	10.84	56.16	20.4	59.53	50.36	20.5	11.83	50.96	20.5	10.60	23.69	20.5	16.08	19.63
21.4	10.62	56.47	21.4	59.45	50.73	21.5	11.81	51.23	21.5	10.60	23.94	21.5	15.90	20.03
22.4	10.41	56.76	22.4	59.37	51.11	22.5	11.80	51.50	22.5	10.62	24.21	22.5	15.69	20.41
23.4	10.20	57.03	23.4	59.29	51.44	23.5	11.79	51.81	23.5	10.63	24.49	23.5	15.47	20.77
24.4	9.98	57.27	24.4	59.20	51.76	24.4	11.79	52.12	24.5	10.65	24.80	24.5	15.24	21.10
25.4	9.78	57.50	25.4	59.11	52.06	25.4	11.76	52.45	25.5	10.66	25.12	25.5	15.00	21.42
26.4	9.58	57.71	26.4	59.03	52.34	26.4	11.69	52.78	26.5	10.65	25.45	26.5	14.77	21.72
27.4	9.37	57.92	27.4	58.95	52.62	27.4	11.60	53.12	27.4	10.62	25.77	27.5	14.55	22.02
28.4	9.17	58.13	28.4	58.87	52.90	28.4	11.47	53.45	28.4	10.58	26.10	28.4	14.35	22.32
29.4	8.98	58.35	29.4	58.78	53.19	29.4	11.31	53.78	29.4	10.53	26.42	29.4	14.15	22.62
30.4	8.78	58.58	30.4	58.71	53.50	30.4	11.14	54.10	30.4	10.48	26.71	30.4	13.96	22.94
31.4	8.58	58.82	31.4	58.63	53.81	31.4	10.95	54.39	31.4	10.43	27.00	31.4	13.76	23.26
11.10	-11.06		6.21	-6.13		20.33	+20.30		7.74	+7.67		18.52	-18.49	
5 ^h 46 ^m	3°.075		6 ^h 46 ^m	53°.600		7 ^h 2 ^m	33°.206		7 ^h 13 ^m	55°.106		7 ^h 16 ^m	0°.004	
-84° 49'	45''.59		-80° 43'	42''.15		+87° 10'	49''.32		+82° 34'	23''.73		-86° 54'	13''.24	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Jan.	8 18	+88 52	Jan.	9 9	-85 20	Jan.	9 25	+81 41	Jan.	9 36	-80 34	Jan.	10 21	+82 58
	s	"		s	"		s	"		s	"		s	"
0.6	11.73	36.17	0.6	0.28	5.10	0.6	40.52	6.33	0.6	26.08	14.99	0.7	21.21	12.33
1.6	12.35	36.47	1.6	0.40	5.40	1.6	40.65	6.55	1.6	26.16	15.28	1.7	21.39	12.48
2.6	12.92	36.77	2.6	0.52	5.70	2.6	40.76	6.77	2.6	26.25	15.58	2.6	21.56	12.64
3.6	13.41	37.06	3.6	0.66	6.02	3.6	40.87	7.00	3.6	26.33	15.89	3.6	21.71	12.81
4.6	13.88	37.34	4.6	0.80	6.34	4.6	40.98	7.21	4.6	26.42	16.21	4.6	21.84	12.95
5.6	14.34	37.62	5.6	0.93	6.70	5.6	41.08	7.41	5.6	26.51	16.55	5.6	21.99	13.09
6.6	14.79	37.87	6.6	1.07	7.07	6.6	41.18	7.61	6.6	26.60	16.90	6.6	22.13	13.23
7.5	15.24	38.11	7.6	1.21	7.44	7.6	41.29	7.80	7.6	26.69	17.26	7.6	22.28	13.37
8.5	15.74	38.35	8.6	1.31	7.83	8.6	41.39	7.96	8.6	26.77	17.64	8.6	22.43	13.49
9.5	16.29	38.61	9.6	1.40	8.23	9.6	41.52	8.14	9.6	26.84	18.04	9.6	22.60	13.61
10.5	16.89	38.87	10.6	1.48	8.62	10.6	41.64	8.32	10.6	26.90	18.42	10.6	22.76	13.73
11.5	17.50	39.15	11.6	1.54	9.00	11.6	41.77	8.52	11.6	26.95	18.81	11.6	22.94	13.87
12.5	18.09	39.47	12.6	1.59	9.38	12.6	41.91	8.74	12.6	27.00	19.18	12.6	23.12	14.03
13.5	18.63	39.78	13.6	1.64	9.75	13.6	42.03	8.97	13.6	27.05	19.53	13.6	23.30	14.20
14.5	19.11	40.12	14.6	1.68	10.07	14.6	42.14	9.23	14.6	27.09	19.87	14.6	23.46	14.40
15.5	19.48	40.46	15.6	1.73	10.40	15.6	42.24	9.51	15.6	27.14	20.20	15.6	23.61	14.63
16.5	19.75	40.79	16.6	1.80	10.74	16.6	42.32	9.79	16.6	27.19	20.53	16.6	23.75	14.87
17.5	19.95	41.11	17.6	1.88	11.10	17.6	42.39	10.07	17.6	27.24	20.88	17.6	23.86	15.10
18.5	20.09	41.41	18.6	1.96	11.46	18.6	42.46	10.32	18.6	27.30	21.25	18.6	23.96	15.32
19.5	20.26	41.68	19.6	2.04	11.86	19.6	42.52	10.56	19.6	27.37	21.63	19.6	24.07	15.52
20.5	20.44	41.93	20.5	2.10	12.27	20.6	42.59	10.78	20.6	27.42	22.05	20.6	24.18	15.71
21.5	20.67	42.20	21.5	2.16	12.70	21.6	42.67	10.98	21.6	27.47	22.47	21.6	24.30	15.88
22.5	20.95	42.47	22.5	2.19	13.12	22.6	42.75	11.20	22.6	27.52	22.89	22.6	24.43	16.06
23.5	21.25	42.78	23.5	2.20	13.53	23.6	42.85	11.43	23.6	27.56	23.31	23.6	24.57	16.24
24.5	21.55	43.09	24.5	2.19	13.91	24.6	42.94	11.69	24.6	27.59	23.71	24.6	24.71	16.46
25.5	21.83	43.42	25.5	2.18	14.29	25.5	43.03	11.95	25.6	27.60	24.09	25.6	24.85	16.69
26.5	22.04	43.75	26.5	2.17	14.65	26.5	43.12	12.23	26.6	27.61	24.47	26.6	24.98	16.95
27.5	22.19	44.10	27.5	2.16	15.01	27.5	43.18	12.56	27.5	27.63	24.83	27.6	25.11	17.21
28.5	22.26	44.46	28.5	2.15	15.37	28.5	43.24	12.88	28.5	27.65	25.18	28.6	25.21	17.48
29.5	22.24	44.79	29.5	2.15	15.73	29.5	43.29	13.19	29.5	27.66	25.53	29.6	25.31	17.77
30.5	22.18	45.13	30.5	2.15	16.09	30.5	43.34	13.50	30.5	27.69	25.89	30.6	25.40	18.06
31.5	22.06	45.47	31.5	2.16	16.46	31.5	43.37	13.82	31.5	27.72	26.26	31.6	25.48	18.35
51.07	+51.06		12.30	-12.26		6.91	+6.84		6.11	-6.02		8.17	+8.11	
8 ^h 16 ^m 48 ^s .125			9 ^h 8 ^m 49 ^s .775			9 ^h 25 ^m 30 ^s .501			9 ^h 36 ^m 20 ^s .688			10 ^h 21 ^m 12 ^s .394		
+88° 52' 49".08			-85° 20' 12".12			+81° 41' 25".82			-80° 34' 23".04			+82° 58' 35".87		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

77 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Jan.	h m 11 0	° ' -84 8	Jan.	h m 12 14	° ' +88 8	Jan.	h m 12 46	° ' -84 40	Jan.	h m 12 48	° ' +83 51	Jan.	h m 13 27	° ' -85 21
0.7	0.47	58.53	0.7	32.73	48.70	0.8	14.86	28.71	0.8	30.30	3.53	0.8	23.59	47.62
1.7	0.65	58.72	1.7	33.46	48.68	1.8	15.10	28.77	1.8	30.52	3.46	1.8	23.86	47.62
2.7	0.83	58.95	2.7	34.17	48.72	2.7	15.33	28.83	2.8	30.74	3.40	2.8	24.14	47.62
3.7	1.02	59.17	3.7	34.84	48.74	3.7	15.61	28.90	3.7	30.94	3.36	3.8	24.43	47.63
4.7	1.22	59.39	4.7	35.49	48.76	4.7	15.86	28.96	4.7	31.14	3.33	4.8	24.74	47.63
5.7	1.42	59.61	5.7	36.11	48.75	5.7	16.13	29.04	5.7	31.33	3.31	5.8	25.06	47.63
6.7	1.62	59.87	6.7	36.72	48.80	6.7	16.41	29.14	6.7	31.52	3.27	6.8	25.38	47.66
7.7	1.83	60.14	7.7	37.32	48.80	7.7	16.70	29.28	7.7	31.71	3.22	7.8	25.72	47.71
8.7	2.03	60.44	8.7	37.92	48.81	8.7	16.99	29.40	8.7	31.90	3.18	8.8	26.06	47.78
9.7	2.22	60.75	9.7	38.55	48.80	9.7	17.26	29.57	9.7	32.10	3.10	9.8	26.40	47.87
10.7	2.40	61.07	10.7	39.23	48.79	10.7	17.54	29.75	10.7	32.31	3.04	10.8	26.72	47.99
11.6	2.55	61.40	11.7	39.93	48.78	11.7	17.78	29.93	11.7	32.53	2.98	11.8	27.04	48.11
12.6	2.70	61.71	12.7	40.67	48.78	12.7	18.03	30.12	12.7	32.76	2.92	12.8	27.33	48.23
13.6	2.84	62.00	13.7	41.42	48.82	13.7	18.25	30.31	13.7	33.00	2.88	13.7	27.60	48.36
14.6	2.97	62.29	14.7	42.17	48.87	14.7	18.47	30.48	14.7	33.24	2.88	14.7	27.88	48.46
15.6	3.11	62.57	15.7	42.90	48.96	15.7	18.69	30.63	15.7	33.47	2.90	15.7	28.14	48.57
16.6	3.26	62.85	16.7	43.58	49.06	16.7	18.92	30.76	16.7	33.69	2.95	16.7	28.42	48.65
17.6	3.42	63.12	17.7	44.20	49.17	17.7	19.16	30.90	17.7	33.88	3.01	17.7	28.70	48.73
18.6	3.59	63.40	18.7	44.77	49.27	18.7	19.43	31.04	18.7	34.07	3.06	18.7	29.02	48.81
19.6	3.77	63.72	19.7	45.32	49.37	19.7	19.70	31.22	19.7	34.25	3.11	19.7	29.36	48.91
20.6	3.95	64.05	20.7	45.87	49.45	20.7	19.97	31.42	20.7	34.43	3.16	20.7	29.70	49.04
21.6	4.11	64.41	21.7	46.42	49.53	21.7	20.24	31.64	21.7	34.61	3.19	21.7	30.04	49.20
22.6	4.26	64.78	22.7	47.00	49.62	22.7	20.51	31.87	22.7	34.80	3.21	22.7	30.36	49.37
23.6	4.40	65.15	23.7	47.63	49.69	23.7	20.76	32.12	23.7	35.00	3.23	23.7	30.68	49.55
24.6	4.52	65.52	24.7	48.28	49.78	24.7	20.99	32.37	24.7	35.22	3.27	24.7	30.96	49.73
25.6	4.62	65.86	25.7	48.97	49.88	25.7	21.20	32.62	25.7	35.44	3.31	25.7	31.25	49.93
26.6	4.73	66.20	26.7	49.65	50.01	26.7	21.40	32.86	26.7	35.67	3.39	26.7	31.51	50.12
27.6	4.82	66.53	27.7	50.32	50.16	27.7	21.60	33.09	27.7	35.89	3.47	27.7	31.75	50.30
28.6	4.92	66.85	28.7	50.97	50.33	28.7	21.80	33.32	28.7	36.11	3.59	28.7	32.01	50.47
29.6	5.03	67.17	29.7	51.58	50.50	29.7	22.00	33.53	29.7	36.30	3.71	29.7	32.27	50.62
30.6	5.15	67.48	30.6	52.15	50.69	30.7	22.22	33.74	30.7	36.49	3.84	30.7	32.53	50.77
31.6	5.27	67.81	31.6	52.70	50.89	31.7	22.43	33.95	31.7	36.67	3.99	31.7	32.81	50.94
9.81	-9.76		30.93	+30.91		10.78	-10.73		9.34	+9.28		12.37	-12.33	
10 ^h 59 ^m 54 ^s .915			12 ^h 14 ^m 28 ^s .804			12 ^h 46 ^m 13 ^s .131			12 ^h 48 ^m 30 ^s .862			13 ^h 27 ^m 23 ^s .749		
-84° 9' 9".97			+88° 9' 16".14			-84° 40' 41".95			+83° 51' 30".88			-85° 22' 0".86		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Jan.	h m 14 13	° ' -83 17	Jan.	h m 15 2	° ' +87 32	Jan.	h m 15 24	° ' -84 11	Jan.	h m 16 54	° ' +82 10	Jan.	h m 17 16	° ' -80 46
	s "	"		s "	"		s "	"		s "	"		s "	"
0.8	35.76	25.23	0.9	55.90	35.28	0.9	5.87	32.15	0.9	8.00	16.21	0.9	2.10	64.70
1.8	35.95	25.17	1.8	56.31	35.04	1.9	6.06	32.01	1.9	8.08	15.87	1.9	2.18	64.44
2.8	36.15	25.12	2.8	56.73	34.82	2.9	6.25	31.84	2.9	8.15	15.54	2.9	2.25	64.19
3.8	36.34	25.06	3.8	57.14	34.62	3.9	6.45	31.68	3.9	8.22	15.23	3.9	2.33	63.93
4.8	36.54	24.99	4.8	57.52	34.42	4.9	6.67	31.52	4.9	8.29	14.93	4.9	2.42	63.65
5.8	36.77	24.93	5.8	57.91	34.23	5.8	6.90	31.35	5.9	8.36	14.65	5.9	2.51	63.35
6.8	37.00	24.88	6.8	58.27	34.05	6.8	7.13	31.20	6.9	8.43	14.37	6.9	2.60	63.04
7.8	37.23	24.85	7.8	58.63	33.87	7.8	7.38	31.05	7.9	8.49	14.09	7.9	2.73	62.76
8.8	37.47	24.85	8.8	58.98	33.66	8.8	7.64	30.91	8.9	8.55	13.81	8.9	2.85	62.48
9.8	37.72	24.88	9.8	59.34	33.45	9.8	7.91	30.81	9.9	8.62	13.51	9.9	2.98	62.25
10.8	37.96	24.91	10.8	59.70	33.22	10.8	8.17	30.73	10.9	8.69	13.20	10.9	3.11	62.01
11.8	38.19	24.97	11.8	60.11	33.00	11.8	8.43	30.67	11.9	8.77	12.85	11.9	3.25	61.81
12.8	38.41	25.03	12.8	60.55	32.76	12.8	8.68	30.63	12.9	8.85	12.51	12.9	3.39	61.62
13.8	38.61	25.09	13.8	61.01	32.54	13.8	8.91	30.57	13.9	8.94	12.18	13.9	3.51	61.44
14.8	38.79	25.14	14.8	61.51	32.35	14.8	9.13	30.51	14.9	9.03	11.85	14.9	3.63	61.26
15.8	38.99	25.18	15.8	62.01	32.18	15.8	9.36	30.46	15.9	9.14	11.55	15.9	3.73	61.05
16.8	39.18	25.18	16.8	62.49	32.04	16.8	9.58	30.37	16.9	9.25	11.27	16.9	3.83	60.82
17.8	39.40	25.20	17.8	62.96	31.92	17.8	9.80	30.28	17.9	9.36	11.02	17.9	3.94	60.59
18.8	39.62	25.23	18.8	63.42	31.82	18.8	10.03	30.19	18.9	9.46	10.80	18.9	4.06	60.35
19.8	39.86	25.26	19.8	63.84	31.71	19.8	10.30	30.09	19.9	9.56	10.56	19.9	4.19	60.08
20.8	40.11	25.30	20.8	64.24	31.61	20.8	10.58	30.01	20.9	9.66	10.32	20.9	4.33	59.83
21.8	40.36	25.37	21.8	64.64	31.48	21.8	10.86	29.95	21.9	9.76	10.09	21.9	4.49	59.60
22.8	40.60	25.47	22.8	65.05	31.35	22.8	11.15	29.93	22.9	9.86	9.85	22.9	4.64	59.41
23.8	40.83	25.59	23.8	65.49	31.20	23.8	11.43	29.93	23.9	9.96	9.58	23.9	4.80	59.23
24.7	41.06	25.72	24.8	65.95	31.06	24.8	11.70	29.94	24.9	10.08	9.30	24.9	4.96	59.07
25.7	41.27	25.84	25.8	66.46	30.92	25.8	11.94	29.94	25.9	10.20	9.03	25.9	5.10	58.93
26.7	41.47	25.96	26.8	66.98	30.78	26.8	12.19	29.94	26.9	10.32	8.75	26.9	5.24	58.79
27.7	41.67	26.08	27.8	67.52	30.69	27.8	12.43	29.95	27.9	10.45	8.50	27.9	5.37	58.66
28.7	41.86	26.21	28.8	68.06	30.59	28.8	12.66	29.96	28.8	10.58	8.26	28.9	5.51	58.51
29.7	42.05	26.30	29.8	68.60	30.53	29.8	12.89	29.96	29.8	10.72	8.03	29.9	5.63	58.34
30.7	42.24	26.39	30.8	69.12	30.49	30.8	13.13	29.95	30.8	10.85	7.83	30.9	5.76	58.17
31.7	42.46	26.48	31.8	69.64	30.45	31.8	13.36	29.94	31.8	10.99	7.63	31.9	5.89	58.00
8.56	-8.50		23.32	+23.30		9.88	-9.83		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m 37 ^s .066			15 ^h 3 ^m 21 ^s .809			15 ^h 24 ^m 9 ^s .966			16 ^h 54 ^m 19 ^s .238			17 ^h 16 ^m 6 ^s .064		
-83° 17' 37".78			+87° 32' 56".60			-84° 11' 42".92			+82° 10' 27".09			-80° 47' 10".43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

♌ Ursæ Minoris. Mag. 4.4			♐ Octantis. Mag. 5.2			♈ Ursæ Minoris. Mag. 6.6			♍ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
ash. an me.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
n.	h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "
	17 58	+86 36	Jan.	18 6	-87 39	Jan.	18 59	+89 1	Jan.	19 28	-89 13	Jan.	20 48	+82 13
	s	"		s	"		s	"		s	"		s	"
0.9	12.18	47.67	0.9	27.28	48.17	1.0	42.78	11.54	1.0	11.93	22.57	1.1	26.41	58.93
1.9	12.22	47.32	1.9	27.45	47.86	2.0	42.54	11.20	2.0	11.87	22.25	2.1	26.31	58.63
2.9	12.27	46.96	2.9	27.63	47.54	3.0	42.38	10.86	3.0	11.80	21.89	3.1	26.21	58.35
3.9	12.33	46.63	3.9	27.82	47.22	4.0	42.26	10.54	4.0	11.72	21.54	4.1	26.13	58.06
4.9	12.39	46.30	4.9	28.01	46.88	5.0	42.15	10.22	5.0	11.67	21.19	5.1	26.05	57.78
5.9	12.46	46.01	5.9	28.23	46.54	5.9	42.03	9.93	6.0	11.69	20.82	6.1	25.98	57.51
6.9	12.51	45.72	6.9	28.49	46.18	6.9	41.90	9.64	7.0	11.79	20.43	7.1	25.91	57.28
7.9	12.56	45.43	7.9	28.80	45.83	7.9	41.73	9.36	8.0	11.99	20.03	8.1	25.84	57.03
8.9	12.60	45.14	8.9	29.13	45.49	8.9	41.52	9.08	9.0	12.33	19.64	9.1	25.77	56.79
9.9	12.64	44.82	9.9	29.49	45.16	9.9	41.29	8.76	10.0	12.77	19.25	10.1	25.69	56.52
0.9	12.67	44.50	10.9	29.87	44.86	10.9	41.04	8.45	11.0	13.32	18.88	11.1	25.61	56.25
1.9	12.71	44.15	11.9	30.26	44.58	11.9	40.79	8.12	12.0	13.92	18.52	12.1	25.52	55.98
12.9	12.78	43.79	12.9	30.65	44.31	12.9	40.60	7.77	12.9	14.49	18.19	13.1	25.43	55.67
13.9	12.86	43.42	13.9	31.02	44.07	13.9	40.49	7.41	13.9	15.06	17.88	14.1	25.35	55.35
14.9	12.98	43.06	14.9	31.35	43.81	14.9	40.51	7.04	14.9	15.52	17.56	15.0	25.28	55.01
15.9	13.11	42.72	15.9	31.67	43.55	15.9	40.61	6.70	15.9	15.92	17.24	16.0	25.22	54.66
16.9	13.28	42.41	16.9	31.97	43.27	16.9	40.79	6.36	16.9	16.25	16.91	17.0	25.17	54.32
17.9	13.45	42.12	17.9	32.29	42.98	17.9	41.04	6.03	17.9	16.57	16.55	18.0	25.13	54.01
18.9	13.60	41.84	18.9	32.61	42.66	18.9	41.27	5.74	18.9	16.96	16.18	19.0	25.10	53.72
19.9	13.75	41.58	19.9	32.99	42.32	19.9	41.48	5.44	19.9	17.43	15.80	20.0	25.07	53.44
20.9	13.88	41.32	20.9	33.42	41.98	20.9	41.63	5.17	20.9	18.03	15.41	21.0	25.04	53.18
21.9	14.00	41.05	21.9	33.88	41.66	21.9	41.75	4.90	21.9	18.76	15.01	22.0	25.00	52.91
2.9	14.12	40.77	22.9	34.35	41.37	22.9	41.83	4.61	22.9	19.60	14.63	23.0	24.96	52.63
3.9	14.25	40.48	23.9	34.84	41.10	23.9	41.91	4.29	23.9	20.50	14.27	24.0	24.91	52.32
4.9	14.39	40.16	24.9	35.33	40.86	24.9	42.04	3.97	24.9	21.43	13.93	25.0	24.87	52.00
5.9	14.56	39.85	25.9	35.81	40.63	25.9	42.24	3.63	25.9	22.33	13.60	26.0	24.82	51.66
6.9	14.74	39.53	26.9	36.26	40.41	26.9	42.50	3.27	26.9	23.18	13.31	27.0	24.78	51.30
7.9	14.94	39.21	27.9	36.68	40.19	27.9	42.86	2.93	27.9	23.98	13.00	28.0	24.75	50.94
8.9	15.17	38.91	28.9	37.09	39.97	28.9	43.31	2.59	28.9	24.74	12.69	29.0	24.74	50.58
9.9	15.41	38.63	29.9	37.50	39.73	29.9	43.81	2.27	29.9	25.47	12.38	30.0	24.72	50.22
0.9	15.66	38.36	30.9	37.91	39.49	30.9	44.36	1.96	30.9	26.17	12.06	31.0	24.72	49.87
1.9	15.90	38.12	31.9	38.33	39.24	31.9	44.92	1.67	31.9	26.90	11.74	32.0	24.72	49.54
6.92	+16.89		24.52	-24.49		58.38	+58.37		73.60	-73.60		7.40	+7.33	
7 ^h 58 ^m	41°.809		18 ^h 6 ^m	47°.620		19 ^h 1 ^m	27°.463		19 ^h 29 ^m	16°.746		20 ^h 48 ^m	36°.323	
6° 36'	51''.12		-87° 39'	51''.38		+89° 1'	7''.53		-89° 13'	21''.02		+82° 13'	43''.34	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cepheid. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	s		h m	s		h m	s		h m	s		h m	s
Jan.	21 38	-83 5	Jan.	22 16	-86 23	Jan.	22 37	-81 48	Jan.	23 27	+86 51	Jan.	23 47	-82 28
1.1	24.30	59.20	1.1	12.52	19.16	1.2	42.66	54.45	1.2	36.35	45.19	1.2	18.87	41.19
2.1	24.19	58.95	2.1	12.29	18.93	2.2	42.55	54.26	2.2	35.95	45.09	2.2	18.73	41.09
3.1	24.09	58.68	3.1	12.04	18.70	3.2	42.43	54.06	3.2	35.56	45.00	3.2	18.57	40.98
4.1	23.98	58.40	4.1	11.77	18.44	4.2	42.31	53.86	4.2	35.20	44.90	4.2	18.41	40.86
5.1	23.87	58.12	5.1	11.51	18.18	5.2	42.18	53.64	5.2	34.85	44.80	5.2	18.25	40.73
6.1	23.77	57.82	6.1	11.26	17.91	6.1	42.05	53.40	6.2	34.51	44.71	6.2	18.08	40.58
7.1	23.67	57.50	7.1	11.01	17.62	7.1	41.94	53.14	7.2	34.18	44.64	7.2	17.91	40.41
8.1	23.58	57.16	8.1	10.78	17.30	8.1	41.83	52.85	8.2	33.86	44.56	8.2	17.75	40.24
9.1	23.52	56.81	9.1	10.56	16.97	9.1	41.72	52.57	9.2	33.53	44.49	9.2	17.60	40.02
10.1	23.46	56.47	10.1	10.37	16.64	10.1	41.64	52.26	10.2	33.19	44.42	10.2	17.46	39.79
11.1	23.41	56.12	11.1	10.22	16.30	11.1	41.57	51.95	11.2	32.80	44.35	11.2	17.33	39.55
12.1	23.38	55.77	12.1	10.08	15.96	12.1	41.50	51.65	12.2	32.41	44.27	12.2	17.21	39.32
13.1	23.35	55.45	13.1	9.95	15.66	13.1	41.43	51.38	13.2	32.01	44.15	13.2	17.10	39.10
14.1	23.31	55.14	14.1	9.82	15.38	14.1	41.37	51.10	14.2	31.60	44.02	14.2	16.99	38.88
15.1	23.27	54.85	15.1	9.68	15.10	15.1	41.30	50.84	15.2	31.20	43.86	15.2	16.87	38.68
16.1	23.22	54.55	16.1	9.51	14.81	16.1	41.22	50.59	16.2	30.82	43.69	16.2	16.74	38.49
17.1	23.15	54.24	17.1	9.33	14.52	17.1	41.13	50.33	17.2	30.48	43.50	17.2	16.60	38.30
18.1	23.08	53.92	18.1	9.13	14.21	18.1	41.03	50.06	18.2	30.18	43.32	18.2	16.46	38.10
19.1	23.01	53.57	19.1	8.93	13.88	19.1	40.93	49.78	19.1	29.89	43.16	19.2	16.31	37.88
20.1	22.95	53.21	20.1	8.73	13.52	20.1	40.84	49.46	20.1	29.62	43.01	20.2	16.16	37.64
21.1	22.90	52.83	21.1	8.57	13.15	21.1	40.76	49.10	21.1	29.34	42.87	21.2	16.02	37.37
22.1	22.86	52.44	22.1	8.43	12.78	22.1	40.68	48.74	22.1	29.06	42.73	22.2	15.87	37.08
23.1	22.85	52.05	23.1	8.32	12.40	23.1	40.62	48.39	23.1	28.76	42.59	23.2	15.75	36.79
24.1	22.84	51.67	24.1	8.23	12.02	24.1	40.57	48.04	24.1	28.44	42.43	24.1	15.65	36.50
25.1	22.85	51.30	25.1	8.15	11.66	25.1	40.53	47.70	25.1	28.09	42.27	25.1	15.55	36.22
26.1	22.85	50.96	26.1	8.07	11.32	26.1	40.49	47.37	26.1	27.73	42.09	26.1	15.46	35.94
27.1	22.85	50.63	27.1	8.00	10.99	27.1	40.45	47.06	27.1	27.39	41.89	27.1	15.37	35.67
28.0	22.85	50.31	28.1	7.92	10.67	28.1	40.39	46.76	28.1	27.06	41.67	28.1	15.28	35.41
29.0	22.84	49.99	29.1	7.84	10.35	29.1	40.35	46.46	29.1	26.75	41.42	29.1	15.18	35.16
30.0	22.81	49.66	30.1	7.74	10.01	30.1	40.29	46.16	30.1	26.46	41.16	30.1	15.06	34.91
31.0	22.78	49.32	31.1	7.62	9.68	31.1	40.23	45.85	31.1	26.19	40.92	31.1	14.94	34.65
32.0	22.75	48.97	32.1	7.50	9.34	32.1	40.16	45.53	32.1	25.94	40.66	32.1	14.82	34.38
8.32	-8.26		15.87	-15.84		7.02	-6.95		18.27	+18.24		7.64	-7.57	
21 ^h 38 ^m	29 ^s .050		22 ^h 16 ^m	20 ^s .949		22 ^h 37 ^m	45 ^s .323		23 ^h 27 ^m	43 ^s .851		23 ^h 47 ^m	20 ^s .032	
-83° 5'	50''.66		-86° 23'	9''.03		-81° 48'	43''.57		+86° 51'	18''.76		-82° 28'	28''.42	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursae Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m	° ' "	Feb.	h m	° ' "	Feb.	h m	° ' "	Feb.	h m	° ' "	Feb.	h m	° ' "
	0 57	+85 49		1 30	+88 52		1 41	-85 11		4 10	+85 20		5 35	+85 9
0.2	12.92	31.02	0.2	36.95	29.27	0.2	53.28	14.78	0.3	34.67	41.36	0.4	51.06	46.80
1.2	12.67	30.87	1.2	35.92	29.16	1.2	53.00	14.66	1.3	34.43	41.46	1.4	50.87	47.00
2.2	12.42	30.72	2.2	34.94	29.06	2.2	52.72	14.53	2.3	34.20	41.55	2.4	50.69	47.19
3.2	12.19	30.57	3.2	34.01	28.95	3.2	52.44	14.38	3.3	33.97	41.63	3.4	50.52	47.37
4.2	11.96	30.41	4.2	33.12	28.85	4.2	52.15	14.22	4.3	33.76	41.72	4.4	50.37	47.55
5.2	11.75	30.28	5.2	32.22	28.75	5.2	51.87	14.04	5.3	33.56	41.82	5.4	50.22	47.74
6.2	11.53	30.17	6.2	31.31	28.67	6.2	51.59	13.83	6.3	33.37	41.93	6.4	50.07	47.94
7.2	11.29	30.06	7.2	30.37	28.60	7.2	51.33	13.61	7.3	33.16	42.05	7.4	49.93	48.15
8.2	11.05	29.93	8.2	29.36	28.53	8.2	51.09	13.38	8.3	32.94	42.18	8.3	49.78	48.37
9.2	10.79	29.79	9.2	28.30	28.45	9.2	50.86	13.13	9.3	32.71	42.32	9.3	49.61	48.60
10.2	10.51	29.64	10.2	27.20	28.36	10.2	50.64	12.89	10.3	32.46	42.45	10.3	49.43	48.83
11.1	10.23	29.46	11.2	26.08	28.23	11.2	50.43	12.65	11.3	32.20	42.56	11.3	49.22	49.04
12.1	9.96	29.26	12.2	24.99	28.08	12.2	50.21	12.45	12.3	31.93	42.65	12.3	48.99	49.24
13.1	9.72	29.05	13.2	23.97	27.90	13.2	49.99	12.26	13.3	31.64	42.70	13.3	48.76	49.42
14.1	9.48	28.83	14.2	23.04	27.71	14.2	49.75	12.08	14.3	31.37	42.72	14.3	48.53	49.57
15.1	9.29	28.61	15.2	22.18	27.53	15.2	49.50	11.88	15.3	31.13	42.72	15.3	48.31	49.68
16.1	9.10	28.40	16.2	21.37	27.34	16.2	49.23	11.67	16.3	30.88	42.72	16.3	48.10	49.79
17.1	8.94	28.19	17.2	20.65	27.16	17.2	48.95	11.44	17.3	30.66	42.73	17.3	47.91	49.89
18.1	8.77	27.98	18.2	19.91	27.00	18.2	48.70	11.18	18.3	30.45	42.76	18.3	47.73	50.00
19.1	8.60	27.79	19.1	19.12	26.84	19.2	48.45	10.91	19.3	30.24	42.80	19.3	47.55	50.13
20.1	8.40	27.61	20.1	18.30	26.69	20.2	48.21	10.62	20.3	30.02	42.85	20.3	47.37	50.27
21.1	8.19	27.41	21.1	17.42	26.54	21.2	48.01	10.32	21.3	29.77	42.90	21.3	47.17	50.43
22.1	7.97	27.20	22.1	16.48	26.38	22.1	47.81	10.03	22.3	29.52	42.95	22.3	46.96	50.59
23.1	7.75	26.96	23.1	15.53	26.20	23.1	47.63	9.75	23.2	29.26	42.98	23.3	46.73	50.74
24.1	7.52	26.73	24.1	14.58	26.01	24.1	47.44	9.47	24.2	28.97	42.99	24.3	46.48	50.89
25.1	7.30	26.47	25.1	13.66	25.77	25.1	47.26	9.22	25.2	28.69	42.99	25.3	46.22	51.01
26.1	7.10	26.18	26.1	12.78	25.52	26.1	47.06	8.97	26.2	28.40	42.96	26.3	45.96	51.11
27.1	6.91	25.90	27.1	11.95	25.27	27.1	46.86	8.72	27.2	28.10	42.92	27.3	45.70	51.20
28.1	6.75	25.61	28.1	11.19	25.02	28.1	46.66	8.47	28.2	27.83	42.86	28.3	45.43	51.26
29.1	6.60	25.32	29.1	10.49	24.76	29.1	46.44	8.21	29.2	27.56	42.78	29.3	45.16	51.31
30.1	6.46	25.03	30.1	9.84	24.51	30.1	46.22	7.94	30.2	27.31	42.70	30.3	44.91	51.36
31.1	6.34	24.75	31.1	9.24	24.26	31.1	46.00	7.68	31.2	27.08	42.62	31.3	44.69	51.39
13.74	+13.70		50.90	+50.89		11.92	-11.88		12.32	+12.28		11.86	+11.82	
0 ^h 57 ^m	16°.959		1 ^h 30 ^m	42°.307		1 ^h 41 ^m	58°.587		4 ^h 10 ^m	20°.187		5 ^h 35 ^m	31°.554	
+85° 49'	4'' 72		+88° 52'	2'' 06		-85° 11'	3'' 34		+85° 20'	19'' 62		+85° 9'	32'' 39	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensse. Mag. 6.2			ζ Mensse. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m ° ' "		Feb.	h m ° ' "		Feb.	h m ° ' "		Feb.	h m ° ' "		Feb.	h m ° ' "	
	5 46 -84 49			6 46 -80 43			7 3 +87 10			7 14 +82 34			7 16 -86 54	
	s " "			s " "			s " "			s " "			s " "	
0.4	8.58 58.82		0.4	58.63 53.81		0.4	10.95 54.39		0.4	10.43 27.00		0.4	13.76 23.26	
1.4	8.38 59.07		1.4	58.55 54.13		1.4	10.77 54.68		1.4	10.36 27.28		1.4	13.54 23.60	
2.4	8.16 59.33		2.4	58.46 54.45		2.4	10.58 54.96		2.4	10.30 27.55		2.4	13.32 23.95	
3.4	7.94 59.58		3.4	58.38 54.78		3.4	10.40 55.21		3.4	10.24 27.80		3.4	13.09 24.31	
4.4	7.71 59.82		4.4	58.28 55.11		4.4	10.25 55.45		4.4	10.19 28.03		4.4	12.83 24.66	
5.4	7.44 60.06		5.4	58.18 55.43		5.4	10.11 55.69		5.4	10.15 28.28		5.4	12.55 25.00	
6.4	7.19 60.26		6.4	58.07 55.74		6.4	9.97 55.95		6.4	10.12 28.54		6.4	12.24 25.34	
7.4	6.93 60.45		7.4	57.95 56.02		7.4	9.84 56.23		7.4	10.08 28.80		7.4	11.92 25.65	
8.4	6.67 60.61		8.4	57.84 56.29		8.4	9.71 56.51		8.4	10.05 29.08		8.4	11.58 25.93	
9.4	6.41 60.75		9.4	57.72 56.53		9.4	9.57 56.82		9.4	10.01 29.39		9.4	11.25 26.20	
10.4	6.17 60.88		10.4	57.59 56.76		10.4	9.39 57.13		10.4	9.95 29.70		10.4	10.92 26.46	
11.3	5.93 61.02		11.4	57.49 56.99		11.4	9.16 57.43		11.4	9.87 30.00		11.4	10.60 26.72	
12.3	5.69 61.19		12.4	57.38 57.22		12.4	8.90 57.72		12.4	9.79 30.29		12.4	10.32 26.98	
13.3	5.46 61.36		13.4	57.27 57.46		13.4	8.62 57.99		13.4	9.69 30.56		13.4	10.03 27.25	
14.3	5.23 61.54		14.4	57.16 57.73		14.4	8.32 58.23		14.4	9.58 30.79		14.4	9.75 27.54	
15.3	4.99 61.74		15.4	57.06 58.02		15.4	8.03 58.46		15.4	9.48 31.02		15.4	9.44 27.86	
16.3	4.72 61.94		16.4	56.94 58.31		16.4	7.75 58.66		16.4	9.39 31.22		16.4	9.14 28.18	
17.3	4.45 62.13		17.4	56.82 58.59		17.4	7.50 58.85		17.4	9.30 31.41		17.4	8.81 28.51	
18.3	4.17 62.31		18.4	56.68 58.87		18.4	7.26 59.04		18.4	9.23 31.62		18.4	8.44 28.82	
19.3	3.89 62.45		19.4	56.55 59.12		19.4	7.04 59.26		19.4	9.16 31.84		19.4	8.06 29.11	
20.3	3.60 62.58		20.4	56.41 59.35		20.4	6.82 59.49		20.4	9.08 32.06		20.4	7.66 29.38	
21.3	3.31 62.68		21.4	56.28 59.55		21.4	6.58 59.74		21.4	9.00 32.30		21.4	7.26 29.61	
22.3	3.03 62.76		22.4	56.15 59.73		22.4	6.31 59.99		22.4	8.92 32.57		22.4	6.88 29.83	
23.3	2.76 62.84		23.4	56.01 59.91		23.4	6.02 60.24		23.4	8.81 32.83		23.4	6.51 30.04	
24.3	2.50 62.92		24.4	55.89 60.09		24.4	5.70 60.49		24.4	8.69 33.08		24.4	6.14 30.26	
25.3	2.26 63.01		25.4	55.75 60.27		25.4	5.34 60.74		25.4	8.57 33.32		25.4	5.79 30.47	
26.3	2.00 63.11		26.3	55.63 60.45		26.4	4.98 60.96		26.4	8.44 33.56		26.4	5.44 30.69	
27.3	1.74 63.21		27.3	55.50 60.64		27.4	4.60 61.16		27.4	8.30 33.77		27.4	5.10 30.91	
28.3	1.49 63.33		28.3	55.38 60.84		28.4	4.21 61.34		28.4	8.15 33.96		28.4	4.76 31.14	
29.3	1.23 63.45		29.3	55.25 61.06		29.4	3.82 61.51		29.4	8.01 34.14		29.4	4.40 31.38	
30.3	0.96 63.56		30.3	55.12 61.27		30.3	3.45 61.65		30.4	7.88 34.30		30.4	4.03 31.65	
31.3	0.68 63.69		31.3	54.98 61.49		31.3	3.09 61.80		31.4	7.75 34.45		31.4	3.65 31.91	
11.11 -11.06			6.21 -6.13			20.35 +20.32			7.74 +7.67			18.54 -18.51		
5 ^h 46 ^m 3 ^s .075			6 ^h 46 ^m 53 ^s .600			7 ^h 2 ^m 33 ^s .206			7 ^h 13 ^m 55 ^s .106			7 ^h 16 ^m 0 ^s .004		
-84° 49' 45".59			-80° 43' 42".15			+87° 10' 49".32			+82° 34' 23".73			-86° 54' 13".24		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			♋ Ootantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			♏ Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m	° ' "	Feb.	h m	° ' "	Feb.	h m	° ' "	Feb.	h m	° ' "	Feb.	h m	° ' "
	8 18	+88 52		9 8	-85 20		9 25	+81 41		9 36	-80 34		10 21	+82 58
0.5	22.06	45.47	0.5	62.16	16.46	0.5	43.37	13.82	0.5	27.72	26.26	0.6	25.48	18.36
1.5	21.92	45.80	1.5	62.17	16.82	1.5	43.40	14.10	1.5	27.75	26.63	1.6	25.56	18.63
2.5	21.76	46.10	2.5	62.18	17.20	2.5	43.41	14.39	2.5	27.76	27.04	2.6	25.61	18.90
3.5	21.61	46.39	3.5	62.18	17.61	3.5	43.44	14.66	3.5	27.78	27.44	3.6	25.69	19.14
4.5	21.50	46.67	4.5	62.17	18.03	4.5	43.47	14.92	4.5	27.80	27.87	4.6	25.76	19.39
5.5	21.41	46.94	5.5	62.14	18.45	5.5	43.51	15.18	5.5	27.82	28.30	5.6	25.83	19.63
6.5	21.37	47.22	6.5	62.09	18.88	6.5	43.55	15.44	6.5	27.82	28.73	6.6	25.92	19.87
7.5	21.36	47.51	7.5	62.01	19.30	7.5	43.60	15.71	7.5	27.82	29.16	7.6	26.02	20.11
8.5	21.36	47.83	8.5	61.93	19.69	8.5	43.65	16.00	8.5	27.81	29.56	8.5	26.11	20.37
9.5	21.32	48.15	9.5	61.85	20.07	9.5	43.71	16.30	9.5	27.79	29.95	9.5	26.20	20.64
10.5	21.21	48.49	10.5	61.76	20.43	10.5	43.75	16.62	10.5	27.77	30.33	10.5	26.30	20.95
11.5	21.01	48.85	11.5	61.68	20.77	11.5	43.77	16.95	11.5	27.75	30.69	11.5	26.38	21.27
12.4	20.71	49.19	12.5	61.60	21.11	12.5	43.78	17.29	12.5	27.73	31.06	12.5	26.43	21.60
13.4	20.34	49.51	13.5	61.55	21.46	13.5	43.77	17.63	13.5	27.72	31.43	13.5	26.47	21.92
14.4	19.89	49.79	14.5	61.51	21.83	14.5	43.76	17.94	14.5	27.71	31.81	14.5	26.50	22.23
15.4	19.44	50.07	15.5	61.46	22.22	15.5	43.75	18.23	15.5	27.70	32.22	15.5	26.51	22.52
16.4	18.99	50.33	16.5	61.40	22.63	16.5	43.73	18.52	16.5	27.70	32.63	16.5	26.53	22.81
17.4	18.60	50.57	17.5	61.32	23.05	17.5	43.72	18.77	17.5	27.69	33.06	17.5	26.56	23.08
18.4	18.25	50.83	18.5	61.24	23.47	18.5	43.72	19.01	18.5	27.68	33.50	18.5	26.59	23.34
19.4	17.95	51.09	19.5	61.13	23.88	19.5	43.73	19.28	19.5	27.64	33.93	19.5	26.63	23.60
20.4	17.66	51.38	20.5	61.00	24.26	20.5	43.74	19.56	20.5	27.60	34.32	20.5	26.68	23.87
21.4	17.34	51.67	21.5	60.86	24.62	21.5	43.75	19.86	21.5	27.56	34.71	21.5	26.72	24.16
22.4	16.98	51.99	22.5	60.73	24.97	22.5	43.75	20.18	22.5	27.52	35.08	22.5	26.76	24.47
23.4	16.55	52.32	23.5	60.58	25.30	23.5	43.74	20.51	23.5	27.47	35.43	23.5	26.80	24.80
24.4	16.06	52.64	24.5	60.45	25.64	24.5	43.71	20.85	24.5	27.42	35.76	24.5	26.82	25.14
25.4	15.48	52.93	25.4	60.33	25.96	25.5	43.68	21.18	25.5	27.37	36.10	25.5	26.83	25.50
26.4	14.85	53.22	26.4	60.20	26.29	26.5	43.64	21.51	26.5	27.33	36.46	26.5	26.83	25.84
27.4	14.16	53.50	27.4	60.10	26.63	27.5	43.59	21.83	27.5	27.30	36.81	27.5	26.81	26.17
28.4	13.44	53.77	28.4	59.99	26.98	28.5	43.54	22.13	28.5	27.25	37.17	28.5	26.78	26.50
29.4	12.71	54.02	29.4	59.88	27.34	29.5	43.48	22.42	29.5	27.21	37.53	29.5	26.75	26.82
30.4	11.98	54.26	30.4	59.75	27.70	30.4	43.42	22.70	30.5	27.18	37.90	30.5	26.73	27.13
31.4	11.28	54.49	31.4	59.63	28.07	31.4	43.36	22.96	31.5	27.14	38.29	31.5	26.70	27.42
51.19	+51.18		12.31	-12.27		6.92	+6.84		6.11	-6.02		8.17	+8.11	
8 ^h 16 ^m	48 ^s .125		9 ^h 8 ^m	49 ^s .775		9 ^h 25 ^m	30 ^s .501		9 ^h 36 ^m	20 ^s .688		10 ^h 21 ^m	12 ^s .394	
+88° 52'	49''.08		-85° 20'	12''.12		+81° 41'	25''.82		-80° 34'	23''.04		+82° 58'	35''.87	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

77 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			K Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m ° '			h m ° '			h m ° '			h m ° '			h m ° '	
Feb.	11 0	-84 9	Feb.	12 14	+88 8	Feb.	12 46	-84 40	Feb.	12 48	+83 51	Feb.	13 27	-85 21
	s "			s "			s "			s "			s "	
0.6	5.27	7.81	0.6	52.70	50.89	0.7	22.43	33.95	0.7	36.67	3.99	0.7	32.81	50.94
1.6	5.39	8.14	1.6	53.21	51.09	1.7	22.66	34.17	1.7	36.85	4.14	1.7	33.09	51.10
2.6	5.52	8.49	2.6	53.69	51.29	2.7	22.90	34.40	2.7	37.02	4.28	2.7	33.39	51.28
3.6	5.64	8.86	3.6	54.16	51.47	3.7	23.13	34.66	3.7	37.19	4.41	3.7	33.70	51.47
4.6	5.75	9.23	4.6	54.63	51.65	4.7	23.37	34.93	4.7	37.35	4.54	4.7	34.01	51.69
5.6	5.86	9.64	5.6	55.12	51.80	5.7	23.60	35.21	5.7	37.51	4.67	5.7	34.30	51.91
6.6	5.96	10.05	6.6	55.62	51.95	6.7	23.83	35.53	6.7	37.68	4.76	6.7	34.59	52.18
7.6	6.02	10.46	7.6	56.16	52.12	7.6	24.03	35.87	7.7	37.87	4.88	7.7	34.88	52.44
8.6	6.08	10.86	8.6	56.72	52.28	8.6	24.22	36.19	8.6	38.06	5.00	8.7	35.12	52.72
9.6	6.14	11.24	9.6	57.31	52.46	9.6	24.39	36.51	9.6	38.26	5.14	9.7	35.37	53.00
10.6	6.20	11.62	10.6	57.89	52.67	10.6	24.56	36.80	10.6	38.46	5.31	10.7	35.60	53.26
11.6	6.24	11.98	11.6	58.45	52.90	11.6	24.72	37.09	11.6	38.65	5.48	11.7	35.82	53.50
12.6	6.29	12.34	12.6	58.96	53.14	12.6	24.88	37.38	12.6	38.83	5.68	12.7	36.04	53.73
13.6	6.37	12.69	13.6	59.41	53.40	13.6	25.05	37.64	13.6	38.99	5.90	13.7	36.28	53.95
14.6	6.44	13.04	14.6	59.80	53.67	14.6	25.25	37.91	14.6	39.13	6.12	14.7	36.55	54.16
15.6	6.52	13.42	15.6	60.16	53.91	15.6	25.45	38.21	15.6	39.27	6.35	15.7	36.81	54.39
16.6	6.61	13.82	16.6	60.49	54.15	16.6	25.67	38.52	16.6	39.39	6.57	16.7	37.09	54.65
17.5	6.69	14.23	17.6	60.82	54.38	17.6	25.87	38.83	17.6	39.51	6.77	17.7	37.37	54.93
18.5	6.75	14.66	18.6	61.16	54.61	18.6	26.07	39.18	18.6	39.65	6.95	18.6	37.65	55.23
19.5	6.80	15.09	19.6	61.55	54.83	19.6	26.26	39.55	19.6	39.79	7.13	19.6	37.90	55.54
20.5	6.83	15.52	20.6	61.96	55.05	20.6	26.42	39.92	20.6	39.94	7.30	20.6	38.13	55.86
21.5	6.85	15.93	21.6	62.39	55.28	21.6	26.57	40.28	21.6	40.11	7.49	21.6	38.36	56.19
22.5	6.86	16.34	22.6	62.84	55.52	22.6	26.71	40.64	22.6	40.27	7.71	22.6	38.55	56.50
23.5	6.87	16.71	23.6	63.27	55.79	23.6	26.83	40.97	23.6	40.42	7.94	23.6	38.75	56.80
24.5	6.88	17.08	24.6	63.69	56.09	24.6	26.95	41.30	24.6	40.57	8.17	24.6	38.93	57.09
25.5	6.89	17.45	25.6	64.05	56.40	25.6	27.07	41.62	25.6	40.72	8.44	25.6	39.11	57.37
26.5	6.90	17.80	26.6	64.38	56.71	26.6	27.20	41.93	26.6	40.84	8.72	26.6	39.31	57.64
27.5	6.93	18.16	27.6	64.67	57.03	27.6	27.34	42.25	27.6	40.96	9.00	27.6	39.51	57.92
28.5	6.95	18.52	28.6	64.92	57.34	28.6	27.48	42.55	28.6	41.06	9.29	28.6	39.71	58.18
29.5	6.98	18.90	29.6	65.15	57.65	29.6	27.63	42.86	29.6	41.15	9.57	29.6	39.93	58.46
30.5	7.01	19.30	30.6	65.33	57.95	30.6	27.78	43.21	30.6	41.24	9.85	30.6	40.15	58.77
31.5	7.03	19.71	31.6	65.51	58.24	31.6	27.94	43.57	31.6	41.32	10.12	31.6	40.38	59.09
9.82	-9.77		30.95	+30.93		10.78	-10.73		9.34	+9.28		12.38	-12.34	
10 ^h 59 ^m 54 ^s .915			12 ^h 14 ^m 28 ^s .804			12 ^h 46 ^m 13 ^s .131			12 ^h 48 ^m 30 ^s .862			13 ^h 27 ^m 23 ^s .749		
-84° 9' 9".97			+88° 9' 16".14			-84° 40' 41".95			+83° 51' 30".88			-85° 22' 0".86		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
sh. no.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
b.	h m 14 13	° ' -83 17	Feb.	h m 15 3	° ' +87 32	Feb.	h m 15 24	° ' -84 11	Feb.	h m 16 54	° ' +82 10	Feb.	h m 17 16	° ' -80 46
	s 46	" 26.48		s 9.64	" 30.45		s 13.36	" 29.94		s 10.99	" 7.63		s 5.89	" 58.00
1.7	42.46	26.48	0.8	9.64	30.45	0.8	13.36	29.94	0.8	10.99	7.63	0.9	5.89	58.00
1.7	42.67	26.57	1.8	10.13	30.44	1.8	13.62	29.94	1.8	11.13	7.45	1.9	6.02	57.82
2.7	42.89	26.67	2.8	10.61	30.43	2.8	13.88	29.91	2.8	11.27	7.28	2.9	6.16	57.63
3.7	43.12	26.80	3.8	11.06	30.40	3.8	14.15	29.90	3.8	11.40	7.12	3.8	6.32	57.44
4.7	43.35	26.94	4.8	11.51	30.37	4.8	14.43	29.92	4.8	11.53	6.96	4.8	6.49	57.28
5.7	43.58	27.12	5.7	11.96	30.34	5.8	14.73	29.96	5.8	11.66	6.79	5.8	6.66	57.12
6.7	43.81	27.30	6.7	12.42	30.29	6.8	15.02	30.03	6.8	11.79	6.61	6.8	6.84	56.99
7.7	44.04	27.52	7.7	12.88	30.24	7.8	15.29	30.11	7.8	11.92	6.42	7.8	7.01	56.89
8.7	44.26	27.74	8.7	13.38	30.19	8.8	15.56	30.20	8.8	12.05	6.21	8.8	7.19	56.80
9.7	44.45	27.94	9.7	13.91	30.13	9.8	15.82	30.31	9.8	12.20	6.01	9.8	7.36	56.72
0.7	44.63	28.13	10.7	14.46	30.10	10.8	16.06	30.42	10.8	12.34	5.81	10.8	7.51	56.65
1.7	44.81	28.32	11.7	15.02	30.10	11.7	16.30	30.51	11.8	12.51	5.64	11.8	7.66	56.58
2.7	44.99	28.50	12.7	15.58	30.13	12.7	16.53	30.57	12.8	12.67	5.50	12.8	7.80	56.49
3.7	45.17	28.66	13.7	16.09	30.16	13.7	16.76	30.63	13.8	12.83	5.37	13.8	7.94	56.39
4.7	45.37	28.82	14.7	16.60	30.22	14.7	17.02	30.68	14.8	12.98	5.28	14.8	8.08	56.26
5.7	45.59	28.99	15.7	17.06	30.30	15.7	17.28	30.72	15.8	13.13	5.19	15.8	8.25	56.14
6.7	45.81	29.18	16.7	17.49	30.38	16.7	17.56	30.80	16.8	13.28	5.11	16.8	8.41	56.01
7.7	46.04	29.38	17.7	17.92	30.43	17.7	17.84	30.88	17.8	13.43	5.04	17.8	8.59	55.91
8.7	46.26	29.61	18.7	18.34	30.48	18.7	18.13	30.98	18.8	13.57	4.96	18.8	8.78	55.81
9.7	46.47	29.87	19.7	18.80	30.51	19.7	18.41	31.11	19.8	13.71	4.86	19.8	8.96	55.75
0.7	46.67	30.13	20.7	19.27	30.54	20.7	18.68	31.25	20.8	13.85	4.73	20.8	9.15	55.70
1.7	46.86	30.40	21.7	19.76	30.57	21.7	18.93	31.41	21.8	14.02	4.61	21.8	9.33	55.68
2.7	47.04	30.65	22.7	20.27	30.62	22.7	19.17	31.56	22.8	14.18	4.49	22.8	9.50	55.66
3.7	47.19	30.91	23.7	20.81	30.69	23.7	19.40	31.71	23.8	14.35	4.39	23.8	9.65	55.64
4.7	47.34	31.16	24.7	21.35	30.78	24.7	19.63	31.86	24.8	14.52	4.31	24.8	9.80	55.62
5.7	47.51	31.38	25.7	21.87	30.88	25.7	19.85	32.00	25.8	14.69	4.25	25.8	9.96	55.58
6.7	47.67	31.61	26.7	22.39	31.01	26.7	20.07	32.12	26.8	14.86	4.19	26.8	10.11	55.54
7.7	47.84	31.81	27.7	22.87	31.15	27.7	20.29	32.23	27.8	15.03	4.17	27.8	10.25	55.49
8.7	48.01	32.03	28.7	23.35	31.32	28.7	20.52	32.36	28.8	15.20	4.16	28.8	10.40	55.44
9.7	48.18	32.26	29.7	23.79	31.48	29.7	20.77	32.49	29.8	15.36	4.16	29.8	10.57	55.38
0.6	48.37	32.50	30.7	24.21	31.65	30.7	21.01	32.62	30.8	15.52	4.17	30.8	10.73	55.32
1.6	48.56	32.75	31.7	24.62	31.80	31.7	21.28	32.76	31.8	15.67	4.20	31.8	10.91	55.28
8.56	-8.50	23.31	+23.29	9.88	-9.83	7.34	+7.27	6.24	-6.16					
4 ^h 13 ^m	37°.066	15 ^h 3 ^m	21°.809	15 ^h 24 ^m	9°.966	16 ^h 54 ^m	19°.238	17 ^h 16 ^m	6°.064					
3° 17'	37''.78	+87° 32'	56''.60	-84° 11'	42''.92	+82° 10'	27''.09	-80° 47'	10''.43					

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Urse Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Urse Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Feb.	17 58	+86 36	Feb.	18 6	-87 39	Feb.	18 59	+89 0	Feb.	19 28	-89 13	Feb.	20 48	+82
	s	"		s	"		s	"		s	"		s	"
0.9	15.90	38.12	0.9	38.33	39.24	0.9	44.92	61.67	0.9	26.90	11.74	1.0	24.72	49
1.9	16.15	37.88	1.9	38.77	38.98	1.9	45.50	61.38	1.9	27.66	11.40	2.0	24.72	49
2.9	16.40	37.68	2.9	39.23	38.71	2.9	46.07	61.10	2.9	28.50	11.06	2.9	24.74	48
3.9	16.63	37.48	3.9	39.73	38.44	3.9	46.63	60.85	3.9	29.43	10.70	3.9	24.75	48
4.9	16.86	37.25	4.9	40.27	38.17	4.9	47.12	60.59	4.9	30.47	10.36	4.9	24.76	48
5.9	17.08	37.03	5.9	40.83	37.94	5.9	47.58	60.34	5.9	31.61	10.02	5.9	24.76	48
6.9	17.28	36.79	6.9	41.43	37.74	6.9	48.00	60.08	6.9	32.85	9.69	6.9	24.77	47
7.9	17.50	36.55	7.9	42.02	37.53	7.9	48.44	59.79	7.9	34.17	9.38	7.9	24.76	47
8.9	17.72	36.28	8.9	42.61	37.34	8.9	48.89	59.48	8.9	35.51	9.09	8.9	24.76	47
9.9	17.98	36.01	9.9	43.18	37.18	9.9	49.42	59.17	9.9	36.82	8.82	9.9	24.76	46
10.9	18.25	35.75	10.9	43.73	37.02	10.9	50.04	58.85	10.9	38.05	8.55	10.9	24.77	46
11.9	18.54	35.51	11.9	44.25	36.86	11.9	50.75	58.56	11.9	39.20	8.29	11.9	24.78	46
12.9	18.86	35.27	12.9	44.73	36.70	12.9	51.57	58.27	12.9	40.28	8.01	12.9	24.82	45
13.8	19.17	35.07	13.9	45.23	36.51	13.9	52.44	58.02	13.9	41.31	7.71	13.9	24.86	45
14.8	19.49	34.91	14.9	45.73	36.28	14.9	53.31	57.79	14.9	42.36	7.39	14.9	24.91	45
15.8	19.80	34.77	15.9	46.28	36.07	15.9	54.15	57.58	15.9	43.49	7.06	15.9	24.97	44
16.8	20.09	34.63	16.8	46.86	35.84	16.9	54.95	57.39	16.9	44.73	6.73	16.9	25.02	44
17.8	20.37	34.48	17.8	47.49	35.64	17.9	55.72	57.19	17.9	46.09	6.41	17.9	25.07	44
18.8	20.64	34.31	18.8	48.13	35.44	18.9	56.43	56.97	18.9	47.56	6.09	18.9	25.11	43
19.8	20.91	34.14	19.8	48.78	35.29	19.9	57.12	56.74	19.9	49.08	5.81	19.9	25.15	43
20.8	21.18	33.96	20.8	49.43	35.14	20.9	57.84	56.51	20.9	50.63	5.54	20.9	25.19	43
21.8	21.49	33.77	21.8	50.06	35.03	21.9	58.60	56.26	21.9	52.18	5.31	21.9	25.24	42
22.8	21.80	33.58	22.8	50.67	34.92	22.9	59.43	56.00	22.9	53.69	5.06	22.9	25.28	42
23.8	22.13	33.40	23.8	51.25	34.81	23.9	60.35	55.74	23.9	55.12	4.83	23.9	25.33	42
24.8	22.48	33.22	24.8	51.81	34.70	24.9	61.34	55.50	24.9	56.49	4.61	24.9	25.39	41
25.8	22.84	33.08	25.8	52.36	34.59	25.9	62.39	55.26	25.9	57.82	4.39	25.9	25.45	41
26.8	23.22	32.94	26.8	52.91	34.46	26.9	63.47	55.05	26.9	59.12	4.16	26.9	25.53	41
27.8	23.59	32.82	27.8	53.45	34.33	27.9	64.59	54.85	27.9	60.42	3.93	27.9	25.61	41
28.8	23.96	32.72	28.8	54.00	34.19	28.9	65.71	54.68	28.9	61.73	3.66	28.9	25.71	40
29.8	24.32	32.64	29.8	54.59	34.05	29.8	66.82	54.52	29.9	63.10	3.40	29.9	25.80	40
30.8	24.67	32.58	30.8	55.18	33.90	30.8	67.89	54.35	30.9	64.55	3.14	30.9	25.90	40
31.8	25.01	32.52	31.8	55.82	33.75	31.8	68.93	54.21	31.9	66.07	2.88	31.9	25.99	39
16.91	+16.88		24.49	-24.47		58.23	+58.22		73.33	-73.32		7.40	+7.33	
17 ^h 58 ^m 41 ^s .809			18 ^h 6 ^m 47 ^s .620			19 ^h 1 ^m 27 ^s .463			19 ^h 29 ^m 16 ^s .746			20 ^h 48 ^m 36 ^s .3		
+86° 36' 51".12			-87° 39' 51".38			+89° 1' 7".53			-89° 13' 21".02			+82° 13' 43".3		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
sh. m. s.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
b.	h m 21 38	° ' -83 5	Feb.	h m 22 16	° ' -86 22	Feb.	h m 22 37	° ' -81 48	Feb.	h m 23 27	° ' +86 51	Feb.	h m 23 47	° ' -82 28
1.0	s 22.75	" 48.97	1.1	s 7.50	" 69.34	1.1	s 40.16	" 45.53	1.1	s 25.94	" 40.66	1.1	s 14.82	" 34.38
2.0	22.73	48.61	2.1	7.39	68.97	2.1	40.10	45.19	2.1	25.71	40.41	2.1	14.70	34.11
3.0	22.71	48.23	3.1	7.28	68.60	3.1	40.04	44.84	3.1	25.49	40.17	3.1	14.58	33.82
4.0	22.70	47.84	4.1	7.18	68.21	4.1	39.98	44.48	4.1	25.27	39.94	4.1	14.47	33.51
5.0	22.70	47.44	5.1	7.11	67.79	5.1	39.93	44.10	5.1	25.06	39.73	5.1	14.36	33.18
6.0	22.72	47.04	6.0	7.06	67.39	6.1	39.90	43.71	6.1	24.85	39.52	6.1	14.27	32.83
7.0	22.76	46.63	7.0	7.04	66.99	7.1	39.89	43.32	7.1	24.61	39.31	7.1	14.19	32.48
8.0	22.81	46.24	8.0	7.04	66.59	8.1	39.88	42.93	8.1	24.35	39.09	8.1	14.12	32.12
9.0	22.86	45.87	9.0	7.06	66.20	9.1	39.88	42.54	9.1	24.08	38.86	9.1	14.05	31.77
0.0	22.91	45.52	10.0	7.09	65.82	10.1	39.88	42.19	10.1	23.80	38.60	10.1	13.99	31.43
1.0	22.95	45.18	11.0	7.11	65.47	11.1	39.88	41.85	11.1	23.55	38.33	11.1	13.93	31.11
2.0	22.98	44.83	12.0	7.11	65.13	12.0	39.86	41.52	12.1	23.31	38.04	12.1	13.86	30.81
3.0	23.00	44.49	13.0	7.08	64.79	13.0	39.83	41.19	13.1	23.10	37.73	13.1	13.78	30.51
4.0	23.02	44.14	14.0	7.04	64.43	14.0	39.79	40.84	14.1	22.92	37.42	14.1	13.70	30.20
4.9	23.04	43.78	15.0	7.00	64.06	15.0	39.76	40.48	15.1	22.78	37.12	15.1	13.61	29.88
5.9	23.05	43.40	16.0	6.95	63.65	16.0	39.73	40.11	16.1	22.66	36.84	16.1	13.51	29.55
6.9	23.08	42.99	17.0	6.92	63.24	17.0	39.70	39.71	17.1	22.54	36.57	17.1	13.42	29.19
7.9	23.12	42.58	18.0	6.92	62.82	18.0	39.70	39.30	18.1	22.42	36.31	18.1	13.34	28.81
8.9	23.18	42.16	19.0	6.95	62.38	19.0	39.70	38.88	19.1	22.28	36.07	19.1	13.28	28.41
9.9	23.25	41.74	20.0	7.00	61.97	20.0	39.71	38.47	20.1	22.13	35.82	20.1	13.23	28.02
0.9	23.34	41.35	21.0	7.08	61.58	21.0	39.73	38.08	21.1	21.96	35.56	21.1	13.19	27.64
1.9	23.43	40.99	22.0	7.17	61.20	22.0	39.75	37.70	22.1	21.78	35.27	22.1	13.15	27.26
2.9	23.51	40.65	23.0	7.25	60.83	23.0	39.78	37.33	23.1	21.60	34.96	23.1	13.12	26.90
3.9	23.58	40.32	24.0	7.32	60.48	24.0	39.80	36.98	24.0	21.44	34.64	24.1	13.08	26.55
4.9	23.64	40.00	24.9	7.39	60.13	25.0	39.81	36.64	25.0	21.29	34.31	25.1	13.04	26.21
5.9	23.70	39.68	25.9	7.45	59.78	26.0	39.82	36.30	26.0	21.17	33.98	26.1	12.99	25.88
6.9	23.76	39.35	26.9	7.49	59.42	27.0	39.83	35.95	27.0	21.07	33.65	27.1	12.95	25.55
7.9	23.81	39.00	27.9	7.52	59.06	28.0	39.83	35.59	28.0	21.00	33.30	28.1	12.90	25.22
8.9	23.86	38.64	28.9	7.56	58.69	29.0	39.83	35.22	29.0	20.94	32.95	29.1	12.84	24.87
9.9	23.92	38.28	29.9	7.60	58.29	29.9	39.83	34.85	30.0	20.91	32.62	30.0	12.79	24.51
0.9	23.98	37.90	30.9	7.65	57.89	30.9	39.84	34.45	31.0	20.88	32.31	31.0	12.73	24.13
1.9	24.06	37.52	31.9	7.72	57.49	31.9	39.87	34.04	32.0	20.87	32.02	32.0	12.69	23.74
8.32	-8.26		15.86	-15.83		7.02	-6.95		18.26	+18.23		7.64	-7.57	
1 ^h 38 ^m	29 ^s .060		22 ^h 16 ^m	20 ^s .949		22 ^h 37 ^m	45 ^s .323		23 ^h 27 ^m	43 ^s .851		23 ^h 47 ^m	20 ^s .032	
3 ^o 5'	50''.66		-86 ^o 23'	9''.03		-81 ^o 48'	43''.57		+86 ^o 51'	18''.76		-82 ^o 28'	28''.42	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 9 Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
Mar. 0 57	+85 49		Mar. 1 29	+88 52		Mar. 1 41	-85 10		Mar. 4 10	+85 20		Mar. 5 35	+85 32	
0.1	6.75	25.61	0.1	71.19	25.02	0.1	46.66	68.47	0.2	27.83	42.86	0.3	45.43	51
1.1	6.60	25.32	1.1	70.49	24.76	1.1	46.44	68.21	1.2	27.56	42.78	1.3	45.16	51
2.1	6.46	25.03	2.1	69.84	24.51	2.1	46.22	67.94	2.2	27.31	42.70	2.3	44.91	51
3.1	6.34	24.75	3.1	69.24	24.26	3.1	46.00	67.68	3.2	27.08	42.62	3.3	44.69	51
4.1	6.22	24.49	4.1	68.67	24.01	4.1	45.79	67.38	4.2	26.84	42.54	4.3	44.46	51
5.1	6.11	24.24	5.1	68.11	23.77	5.1	45.58	67.06	5.2	26.62	42.47	5.3	44.25	51
6.1	5.99	24.01	6.1	67.52	23.54	6.1	45.38	66.73	6.2	26.41	42.42	6.3	44.04	51
7.1	5.86	23.78	7.1	66.89	23.32	7.1	45.20	66.38	7.2	26.19	42.38	7.3	43.83	51
8.1	5.72	23.53	8.1	66.21	23.11	8.1	45.05	66.02	8.2	25.96	42.35	8.3	43.61	51
9.1	5.56	23.26	9.1	65.50	22.88	9.1	44.90	65.67	9.2	25.73	42.32	9.3	43.39	51
10.1	5.40	22.99	10.1	64.76	22.64	10.1	44.76	65.33	10.2	25.46	42.27	10.3	43.14	51
11.1	5.24	22.69	11.1	64.04	22.36	11.1	44.62	65.00	11.2	25.18	42.19	11.3	42.87	51
12.1	5.10	22.36	12.1	63.40	22.06	12.1	44.48	64.72	12.2	24.91	42.10	12.3	42.59	51
13.1	5.00	22.02	13.1	62.82	21.75	13.1	44.31	64.42	13.2	24.64	41.96	13.3	42.31	51
14.1	4.93	21.69	14.1	62.35	21.45	14.1	44.14	64.12	14.2	24.39	41.81	14.3	42.05	51
15.1	4.87	21.37	15.1	61.98	21.14	15.1	43.95	63.81	15.2	24.15	41.66	15.3	41.80	51
16.1	4.82	21.05	16.1	61.66	20.85	16.1	43.77	63.50	16.2	23.96	41.50	16.2	41.57	51
17.1	4.78	20.77	17.1	61.35	20.56	17.1	43.58	63.14	17.2	23.76	41.34	17.2	41.35	51
18.1	4.74	20.50	18.1	61.04	20.29	18.1	43.41	62.78	18.2	23.57	41.20	18.2	41.15	51
19.0	4.69	20.22	19.1	60.69	20.04	19.1	43.26	62.40	19.2	23.38	41.07	19.2	40.94	51
20.0	4.62	19.96	20.1	60.29	19.79	20.1	43.12	62.01	20.2	23.18	40.96	20.2	40.72	51
21.0	4.54	19.68	21.1	59.84	19.53	21.1	43.02	61.64	21.2	22.96	40.84	21.2	40.50	51
22.0	4.45	19.39	22.1	59.36	19.26	22.1	42.92	61.27	22.2	22.73	40.71	22.2	40.26	51
23.0	4.37	19.07	23.1	58.88	18.97	23.1	42.82	60.91	23.2	22.49	40.58	23.2	40.00	51
24.0	4.29	18.73	24.1	58.44	18.66	24.1	42.73	60.56	24.2	22.24	40.42	24.2	39.72	51
25.0	4.23	18.40	25.1	58.03	18.34	25.1	42.63	60.22	25.2	22.00	40.23	25.2	39.45	51
26.0	4.18	18.06	26.1	57.67	18.00	26.1	42.52	59.90	26.2	21.75	40.03	26.2	39.18	51
27.0	4.14	17.71	27.0	57.39	17.67	27.1	42.41	59.58	27.2	21.51	39.83	27.2	38.91	51
28.0	4.13	17.36	28.0	57.18	17.32	28.1	42.29	59.26	28.2	21.29	39.61	28.2	38.65	51
29.0	4.13	17.01	29.0	57.03	16.97	29.1	42.17	58.92	29.2	21.09	39.38	29.2	38.40	51
30.0	4.16	16.67	30.0	56.93	16.64	30.0	42.04	58.59	30.2	20.91	39.14	30.2	38.17	51
31.0	4.19	16.37	31.0	56.87	16.32	31.0	41.91	58.23	31.2	20.72	38.91	31.2	37.95	51
13.73	+13.69		50.82	+50.81		11.91	-11.87		12.32	+12.28		11.86	+11.8	
0 ^h 57 ^m 16 ^s .959			1 ^h 30 ^m 42 ^s .307			1 ^h 41 ^m 58 ^s .587			4 ^h 10 ^m 20 ^s .187			5 ^h 35 ^m 31 ^s .1		
+85° 49' 4".72			+88° 52' 2".06			-85° 11' 3".34			+85° 20' 19".62			+85° 9' 32".		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensse. Mag. 6.2			ζ Mensse. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Ootantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
Mar. 5 45	-84 50		Mar. 6 46	-80 44		Mar. 7 2	+87 11		Mar. 7 14	+82 34		Mar. 7 15	-86 54	
0.3	61.49	3.33	0.3	55.38	0.84	0.4	64.21	1.34	0.4	8.15	33.96	0.4	64.76	31.14
1.3	61.23	3.45	1.3	55.25	1.06	1.4	63.82	1.51	1.4	8.01	34.14	1.4	64.40	31.38
2.3	60.96	3.56	2.3	55.12	1.27	2.3	63.45	1.65	2.4	7.88	34.30	2.4	64.03	31.65
3.3	60.68	3.69	3.3	54.98	1.49	3.3	63.09	1.80	3.4	7.75	34.45	3.4	63.65	31.91
4.3	60.39	3.78	4.3	54.84	1.68	4.3	62.76	1.94	4.4	7.63	34.60	4.4	63.24	32.16
5.3	60.08	3.86	5.3	54.69	1.88	5.3	62.43	2.09	5.3	7.53	34.75	5.4	62.80	32.40
6.3	59.78	3.91	6.3	54.54	2.05	6.3	62.12	2.24	6.3	7.42	34.92	6.3	62.35	32.63
7.3	59.48	3.95	7.3	54.39	2.19	7.3	61.82	2.41	7.3	7.32	35.08	7.3	61.89	32.82
8.3	59.19	3.95	8.3	54.23	2.32	8.3	61.51	2.58	8.3	7.20	35.26	8.3	61.43	32.98
9.3	58.90	3.96	9.3	54.08	2.42	9.3	61.16	2.76	9.3	7.08	35.46	9.3	60.97	33.12
10.3	58.62	3.97	10.3	53.93	2.52	10.3	60.80	2.94	10.3	6.96	35.66	10.3	60.55	33.27
11.3	58.34	3.98	11.3	53.79	2.62	11.3	60.40	3.12	11.3	6.81	35.85	11.3	60.14	33.41
12.3	58.08	4.01	12.3	53.65	2.75	12.3	59.97	3.27	12.3	6.64	36.00	12.3	59.74	33.55
13.3	57.82	4.04	13.3	53.51	2.88	13.3	59.52	3.40	13.3	6.48	36.14	13.3	59.34	33.73
14.3	57.54	4.09	14.3	53.37	3.02	14.3	59.08	3.49	14.3	6.32	36.25	14.3	58.94	33.92
15.3	57.27	4.15	15.3	53.23	3.17	15.3	58.65	3.57	15.3	6.16	36.33	15.3	58.54	34.13
16.3	56.96	4.20	16.3	53.08	3.32	16.3	58.26	3.62	16.3	6.02	36.41	16.3	58.10	34.34
17.3	56.66	4.24	17.3	52.92	3.47	17.3	57.88	3.68	17.3	5.88	36.46	17.3	57.65	34.54
18.3	56.35	4.25	18.3	52.77	3.60	18.3	57.52	3.76	18.3	5.76	36.54	18.3	57.18	34.73
19.2	56.05	4.23	19.3	52.61	3.70	19.3	57.18	3.84	19.3	5.63	36.62	19.3	56.70	34.88
20.2	55.75	4.20	20.3	52.45	3.79	20.3	56.83	3.92	20.3	5.51	36.74	20.3	56.21	35.02
21.2	55.46	4.15	21.3	52.29	3.85	21.3	56.46	4.02	21.3	5.38	36.86	21.3	55.74	35.12
22.2	55.18	4.10	22.3	52.13	3.89	22.3	56.05	4.13	22.3	5.23	36.98	22.3	55.27	35.21
23.2	54.90	4.04	23.3	51.97	3.93	23.3	55.64	4.24	23.3	5.06	37.10	23.3	54.81	35.29
24.2	54.63	3.98	24.3	51.83	3.96	24.3	55.18	4.34	24.3	4.90	37.22	24.3	54.37	35.37
25.2	54.37	3.93	25.3	51.68	4.01	25.3	54.73	4.43	25.3	4.72	37.31	25.3	53.95	35.46
26.2	54.11	3.89	26.3	51.53	4.06	26.3	54.26	4.48	26.3	4.55	37.37	26.3	53.54	35.55
27.2	53.85	3.85	27.3	51.39	4.12	27.3	53.78	4.52	27.3	4.38	37.43	27.3	53.12	35.66
28.2	53.59	3.83	28.3	51.25	4.18	28.3	53.31	4.53	28.3	4.20	37.46	28.3	52.70	35.78
29.2	53.32	3.80	29.3	51.11	4.26	29.3	52.84	4.54	29.3	4.02	37.49	29.3	52.27	35.90
30.2	53.04	3.78	30.3	50.96	4.33	30.3	52.40	4.54	30.3	3.86	37.50	30.3	51.82	36.02
31.2	52.77	3.75	31.3	50.80	4.41	31.3	51.98	4.52	31.3	3.69	37.51	31.3	51.37	36.14
11.11	-11.06		6.21	-6.13		20.36	+20.33		7.74	+7.68		18.55	-18.52	
5 ^h 46 ^m 3 ^s .075			6 ^h 46 ^m 53 ^s .600			7 ^h 2 ^m 33 ^s .206			7 ^h 13 ^m 55 ^s .106			7 ^h 16 ^m 0 ^s .004		
-84° 49' 45".59			-80° 43' 42".15			+87° 10' 49".32			+82° 34' 23".73			-86° 54' 13".24		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Mar.	h m s	° ' "	Mar.	h m s	° ' "	Mar.	h m s	° ' "	Mar.	h m s	° ' "	Mar.	h m s	° ' "
	8 17	+88 52		9 8	-85 20		9 25	+81 41		9 36	-80 34		10 21	+82 58
0.4	73.44	53.77	0.4	59.99	26.98	0.5	43.54	22.13	0.5	27.25	37.17	0.5	26.78	26.50
1.4	72.71	54.02	1.4	59.88	27.34	1.5	43.48	22.42	1.5	27.21	37.53	1.5	26.75	26.82
2.4	71.98	54.26	2.4	59.75	27.70	2.4	43.42	22.70	2.5	27.18	37.90	2.5	26.73	27.13
3.4	71.28	54.49	3.4	59.63	28.07	3.4	43.36	22.96	3.5	27.14	38.29	3.5	26.70	27.42
4.4	70.62	54.71	4.4	59.49	28.44	4.4	43.32	23.22	4.4	27.10	38.69	4.5	26.68	27.69
5.4	70.01	54.93	5.4	59.32	28.82	5.4	43.27	23.46	5.4	27.04	39.08	5.5	26.67	27.95
6.4	69.43	55.14	6.4	59.15	29.19	6.4	43.24	23.72	6.4	26.98	39.47	6.5	26.66	28.23
7.4	68.87	55.37	7.4	58.97	29.54	7.4	43.20	23.98	7.4	26.90	39.85	7.5	26.66	28.50
8.4	68.31	55.63	8.4	58.78	29.88	8.4	43.18	24.25	8.4	26.83	40.22	8.5	26.66	28.81
9.4	67.69	55.89	9.4	58.57	30.20	9.4	43.14	24.53	9.4	26.75	40.55	9.5	26.66	29.12
10.4	67.01	56.15	10.4	58.38	30.48	10.4	43.09	24.84	10.4	26.67	40.87	10.5	26.63	29.44
11.4	66.23	56.39	11.4	58.19	30.76	11.4	43.03	25.15	11.4	26.59	41.18	11.5	26.60	29.77
12.4	65.36	56.64	12.4	58.01	31.05	12.4	42.95	25.45	12.4	26.52	41.49	12.5	26.55	30.10
13.4	64.43	56.87	13.4	57.84	31.36	13.4	42.86	25.73	13.4	26.46	41.81	13.5	26.49	30.43
14.4	63.49	57.06	14.4	57.70	31.68	14.4	42.76	26.00	14.4	26.40	42.14	14.5	26.41	30.72
15.4	62.55	57.23	15.4	57.53	32.01	15.4	42.67	26.24	15.4	26.35	42.50	15.5	26.33	31.00
16.4	61.65	57.38	16.4	57.36	32.37	16.4	42.57	26.45	16.4	26.29	42.87	16.4	26.26	31.27
17.4	60.81	57.52	17.4	57.18	32.73	17.4	42.49	26.65	17.4	26.21	43.24	17.4	26.20	31.51
18.4	60.03	57.66	18.4	56.96	33.06	18.4	42.43	26.87	18.4	26.13	43.61	18.4	26.15	31.76
19.4	59.28	57.84	19.4	56.74	33.39	19.4	42.37	27.09	19.4	26.05	43.95	19.4	26.09	32.01
20.4	58.53	58.02	20.4	56.52	33.69	20.4	42.30	27.32	20.4	25.96	44.28	20.4	26.05	32.28
21.3	57.73	58.21	21.4	56.28	33.97	21.4	42.24	27.57	21.4	25.86	44.61	21.4	26.00	32.56
22.3	56.90	58.40	22.4	56.05	34.24	22.4	42.16	27.83	22.4	25.75	44.90	22.4	25.95	32.85
23.3	56.00	58.60	23.4	55.82	34.47	23.4	42.06	28.09	23.4	25.66	45.18	23.4	25.87	33.17
24.3	55.04	58.81	24.4	55.59	34.71	24.4	41.97	28.36	24.4	25.56	45.45	24.4	25.80	33.48
25.3	54.01	59.00	25.4	55.39	34.95	25.4	41.86	28.63	25.4	25.47	45.72	25.4	25.71	33.78
26.3	52.93	59.17	26.4	55.18	35.19	26.4	41.75	28.87	26.4	25.37	45.99	26.4	25.62	34.08
27.3	51.82	59.31	27.4	54.98	35.46	27.4	41.62	29.11	27.4	25.29	46.26	27.4	25.51	34.37
28.3	50.71	59.44	28.4	54.79	35.72	28.4	41.50	29.32	28.4	25.20	46.54	28.4	25.40	34.66
29.3	49.61	59.54	29.4	54.59	35.99	29.4	41.38	29.51	29.4	25.12	46.83	29.4	25.27	34.91
30.3	48.54	59.63	30.4	54.37	36.27	30.4	41.25	29.69	30.4	25.03	47.15	30.4	25.16	35.15
31.3	47.51	59.71	31.4	54.15	36.54	31.4	41.14	29.86	31.4	24.94	47.46	31.4	25.05	35.38
51.27	+51.26		12.31	-12.27		6.92	+6.85		6.11	-6.03		8.18	+8.12	
8 ^h 16 ^m 48 ^s .125			9 ^h 8 ^m 49 ^s .775			9 ^h 25 ^m 30 ^s .501			9 ^h 36 ^m 20 ^s .688			10 ^h 21 ^m 12 ^s .394		
+88° 52' 49".08			-85° 20' 12".12			+81° 41' 25".82			-80° 34' 23".04			+82° 58' 35".87		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "
	11 0	-84 9		12 15	+88 8		12 46	-84 40		12 48	+83 51		13 27	-85 21
0.5	6.95	18.52	0.6	4.92	57.34	0.6	27.48	42.55	0.6	41.06	9.29	0.6	39.71	58.18
1.5	6.98	18.90	1.6	5.15	57.65	1.6	27.63	42.86	1.6	41.15	9.57	1.6	39.93	58.46
2.5	7.01	19.30	2.6	5.33	57.95	2.6	27.78	43.21	2.6	41.24	9.85	2.6	40.15	58.77
3.5	7.03	19.71	3.6	5.51	58.24	3.6	27.94	43.57	3.6	41.32	10.12	3.6	40.38	59.09
4.5	7.04	20.13	4.6	5.70	58.53	4.6	28.09	43.94	4.6	41.42	10.38	4.6	40.60	59.41
5.5	7.05	20.55	5.6	5.89	58.81	5.6	28.23	44.32	5.6	41.51	10.63	5.6	40.82	59.76
6.5	7.04	20.99	6.6	6.12	59.05	6.6	28.37	44.72	6.6	41.61	10.87	6.6	41.02	60.12
7.5	7.01	21.41	7.6	6.38	59.31	7.6	28.47	45.14	7.6	41.71	11.10	7.6	41.20	60.49
8.5	6.98	21.82	8.5	6.66	59.58	8.6	28.57	45.53	8.6	41.83	11.36	8.6	41.37	60.86
9.5	6.94	22.21	9.5	6.93	59.87	9.6	28.65	45.91	9.6	41.94	11.62	9.6	41.51	61.23
10.5	6.89	22.59	10.5	7.18	60.18	10.6	28.73	46.28	10.6	42.04	11.89	10.6	41.65	61.57
11.5	6.85	22.95	11.5	7.39	60.50	11.6	28.80	46.64	11.6	42.14	12.20	11.6	41.79	61.91
12.5	6.81	23.31	12.5	7.55	60.85	12.6	28.88	46.97	12.6	42.23	12.53	12.6	41.93	62.23
13.5	6.80	23.67	13.5	7.65	61.21	13.6	28.97	47.31	13.6	42.28	12.87	13.6	42.09	62.53
14.5	6.79	24.04	14.5	7.70	61.54	14.6	29.09	47.67	14.6	42.33	13.20	14.6	42.26	62.84
15.5	6.77	24.44	15.5	7.71	61.86	15.6	29.21	48.02	15.6	42.37	13.52	15.6	42.45	63.17
16.5	6.76	24.85	16.5	7.71	62.15	16.5	29.33	48.40	16.6	42.40	13.81	16.6	42.64	63.51
17.5	6.74	25.26	17.5	7.71	62.44	17.5	29.43	48.81	17.5	42.44	14.10	17.6	42.83	63.89
18.5	6.70	25.68	18.5	7.75	62.72	18.5	29.54	49.22	18.5	42.48	14.36	18.6	43.00	64.27
19.5	6.65	26.09	19.5	7.83	62.99	19.5	29.63	49.64	19.5	42.54	14.63	19.6	43.15	64.66
20.5	6.57	26.49	20.5	7.92	63.26	20.5	29.68	50.06	20.5	42.59	14.90	20.6	43.28	65.04
21.5	6.50	26.88	21.5	8.02	63.57	21.5	29.74	50.44	21.5	42.66	15.19	21.6	43.38	65.43
22.5	6.42	27.25	22.5	8.12	63.89	22.5	29.77	50.83	22.5	42.73	15.50	22.6	43.48	65.80
23.5	6.33	27.60	23.5	8.18	64.22	23.5	29.80	51.21	23.5	42.78	15.81	23.6	43.57	66.16
24.5	6.25	27.94	24.5	8.23	64.58	24.5	29.83	51.57	24.5	42.82	16.15	24.6	43.66	66.52
25.4	6.17	28.27	25.5	8.23	64.93	25.5	29.86	51.91	25.5	42.86	16.50	25.6	43.75	66.85
26.4	6.11	28.60	26.5	8.19	65.29	26.5	29.90	52.25	26.5	42.87	16.86	26.6	43.84	67.18
27.4	6.05	28.93	27.5	8.10	65.64	27.5	29.95	52.60	27.5	42.88	17.21	27.5	43.95	67.51
28.4	5.98	29.26	28.5	7.98	65.98	28.5	30.00	52.96	28.5	42.88	17.55	28.5	44.05	67.84
29.4	5.92	29.62	29.5	7.84	66.32	29.5	30.05	53.32	29.5	42.87	17.89	29.5	44.18	68.18
30.4	5.87	29.99	30.5	7.67	66.65	30.5	30.11	53.69	30.5	42.84	18.22	30.5	44.30	68.53
31.4	5.79	30.37	31.5	7.50	66.94	31.5	30.17	54.07	31.5	42.83	18.54	31.5	44.42	68.90
9.82	-9.77		30.98	+30.97		10.79	-10.74		9.34	+9.29		12.38	-12.34	
10 ^h 59 ^m 54 ^s .915			12 ^h 14 ^m 28 ^s .804			12 ^h 46 ^m 13 ^s .131			12 ^h 48 ^m 30 ^s .862			13 ^h 27 ^m 23 ^s .749		
-84° 9' 9".97			+88° 9' 16".14			-84° 40' 41".95			+83° 51' 30".88			-85° 22' 0".86		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2333. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursae Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Mar.	14 13	-83 17	Mar.	15 3	+87 32	Mar.	15 24	-84 11	Mar.	16 54	+82 10	Mar.	17 16	-80 46
	s	"		s	"		s	"		s	"		s	"
0.7	48.01	32.03	0.7	23.35	31.32	0.7	20.52	32.36	0.8	15.20	4.16	0.8	10.40	55.44
1.7	48.18	32.26	1.7	23.79	31.48	1.7	20.77	32.49	1.8	15.36	4.16	1.8	10.57	55.38
2.6	48.37	32.50	2.7	24.21	31.65	2.7	21.01	32.62	2.8	15.52	4.17	2.8	10.73	55.32
3.6	48.56	32.75	3.7	24.62	31.80	3.7	21.28	32.76	3.8	15.67	4.20	3.8	10.91	55.28
4.6	48.75	33.01	4.7	25.02	31.95	4.7	21.54	32.94	4.8	15.82	4.21	4.8	11.09	55.24
5.6	48.94	33.30	5.7	25.41	32.09	5.7	21.81	33.11	5.8	15.97	4.21	5.8	11.28	55.24
6.6	49.12	33.62	6.7	25.83	32.21	6.7	22.08	33.33	6.7	16.12	4.20	6.8	11.47	55.26
7.6	49.30	33.95	7.7	26.25	32.33	7.7	22.32	33.55	7.7	16.27	4.17	7.8	11.66	55.29
8.6	49.45	34.27	8.7	26.70	32.46	8.7	22.56	33.78	8.7	16.44	4.15	8.8	11.84	55.34
9.6	49.59	34.59	9.7	27.15	32.59	9.7	22.78	34.02	9.7	16.60	4.12	9.8	12.01	55.40
10.6	49.73	34.90	10.7	27.62	32.73	10.7	22.98	34.25	10.7	16.77	4.12	10.8	12.18	55.46
11.6	49.86	35.20	11.7	28.08	32.91	11.7	23.18	34.44	11.7	16.94	4.14	11.7	12.32	55.50
12.6	49.99	35.46	12.7	28.52	33.13	12.7	23.38	34.64	12.7	17.11	4.18	12.7	12.46	55.52
13.6	50.13	35.73	13.7	28.94	33.36	13.7	23.59	34.82	13.7	17.28	4.26	13.7	12.61	55.52
14.6	50.29	36.00	14.6	29.32	33.59	14.7	23.81	35.00	14.7	17.44	4.36	14.7	12.78	55.52
15.6	50.46	36.28	15.6	29.66	33.81	15.7	24.06	35.17	15.7	17.59	4.46	15.7	12.96	55.52
16.6	50.62	36.58	16.6	29.97	34.04	16.7	24.30	35.39	16.7	17.73	4.56	16.7	13.14	55.52
17.6	50.79	36.89	17.6	30.29	34.25	17.7	24.55	35.59	17.7	17.88	4.66	17.7	13.32	55.56
18.6	50.96	37.22	18.6	30.60	34.45	18.7	24.80	35.84	18.7	18.02	4.75	18.7	13.51	55.61
19.6	51.11	37.58	19.6	30.93	34.64	19.7	25.04	36.10	19.7	18.16	4.83	19.7	13.70	55.68
20.6	51.25	37.94	20.6	31.28	34.82	20.6	25.26	36.37	20.7	18.30	4.88	20.7	13.88	55.77
21.6	51.37	38.30	21.6	31.65	35.01	21.6	25.45	36.65	21.7	18.47	4.94	21.7	14.05	55.88
22.6	51.48	38.64	22.6	32.04	35.22	22.6	25.64	36.93	22.7	18.63	5.01	22.7	14.22	55.99
23.6	51.57	38.96	23.6	32.43	35.44	23.6	25.81	37.18	23.7	18.79	5.09	23.7	14.36	56.10
24.6	51.67	39.28	24.6	32.81	35.68	24.6	26.00	37.42	24.7	18.95	5.19	24.7	14.50	56.19
25.6	51.77	39.57	25.6	33.18	35.94	25.6	26.17	37.67	25.7	19.11	5.31	25.7	14.65	56.28
26.6	51.88	39.88	26.6	33.51	36.22	26.6	26.35	37.89	26.7	19.26	5.45	26.7	14.79	56.36
27.6	51.99	40.18	27.6	33.84	36.50	27.6	26.52	38.12	27.7	19.41	5.61	27.7	14.93	56.41
28.6	52.09	40.48	28.6	34.13	36.79	28.6	26.70	38.35	28.7	19.57	5.78	28.7	15.07	56.48
29.6	52.22	40.78	29.6	34.40	37.08	29.6	26.90	38.58	29.7	19.71	5.96	29.7	15.24	56.54
30.6	52.35	41.10	30.6	34.64	37.37	30.6	27.10	38.81	30.7	19.85	6.14	30.7	15.40	56.62
31.6	52.48	41.42	31.6	34.86	37.65	31.6	27.31	39.07	31.7	19.98	6.33	31.7	15.57	56.70
8.56	-8.50		23.32	+23.30		9.88	-9.83		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m	37 ^s .066		15 ^h 3 ^m	21 ^s .809		15 ^h 24 ^m	9 ^s .966		16 ^h 54 ^m	19 ^s .238		17 ^h 16 ^m	6 ^s .064	
-83° 17'	37''.78		+87° 32'	56''.60		-84° 11'	42''.92		+82° 10'	27''.09		-80° 47'	10''.43	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursa Minoris. Mag. 4.4			χ Ootantis. Mag. 5.2			λ Ursa Minoris. Mag. 6.6			σ Ootantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar. 17 58	+86 36	"	Mar. 18 6	-87 39	"	Mar. 19 0	+89 0	"	Mar. 19 29	-89 12	"	Mar. 20 48	+82 13	"
0.8	23.96	32.72	0.8	54.00	34.19	0.9	5.71	54.68	0.9	1.73	63.66	0.9	25.71	40.73
1.8	24.32	32.64	1.8	54.59	34.05	1.8	6.82	54.52	1.9	3.10	63.40	1.9	25.80	40.44
2.8	24.67	32.58	2.8	55.18	33.90	2.8	7.89	54.35	2.9	4.55	63.14	2.9	25.90	40.20
3.8	25.01	32.52	3.8	55.82	33.75	3.8	8.93	54.21	3.9	6.07	62.88	3.9	25.99	39.96
4.8	25.33	32.44	4.8	56.49	33.62	4.8	9.92	54.08	4.9	7.70	62.62	4.9	26.07	39.72
5.8	25.65	32.36	5.8	57.18	33.52	5.8	10.86	53.94	5.9	9.43	62.38	5.9	26.16	39.47
6.8	25.97	32.28	6.8	57.88	33.43	6.8	11.78	53.78	6.9	11.23	62.15	6.9	26.23	39.21
7.8	26.28	32.18	7.8	58.58	33.38	7.8	12.71	53.61	7.9	13.05	61.96	7.9	26.29	38.95
8.8	26.61	32.07	8.8	59.25	33.34	8.8	13.67	53.44	8.8	14.85	61.77	8.9	26.39	38.69
9.8	26.97	31.95	9.8	59.91	33.31	9.8	14.71	53.26	9.8	16.60	61.60	9.9	26.48	38.40
10.8	27.34	31.85	10.8	60.51	33.28	10.8	15.84	53.08	10.8	18.26	61.43	10.9	26.57	38.11
11.8	27.71	31.77	11.8	61.11	33.24	11.8	17.03	52.92	11.8	19.82	61.26	11.9	26.66	37.84
12.8	28.11	31.72	12.8	61.68	33.19	12.8	18.30	52.78	12.8	21.33	61.07	12.9	26.79	37.57
13.8	28.50	31.71	13.8	62.27	33.12	13.8	19.58	52.68	13.8	22.82	60.88	13.9	26.91	37.33
14.8	28.89	31.72	14.8	62.87	33.03	14.8	20.84	52.59	14.8	24.36	60.67	14.9	27.04	37.12
15.8	29.25	31.75	15.8	63.51	32.93	15.8	22.05	52.53	15.8	25.97	60.44	15.9	27.17	36.92
16.8	29.59	31.78	16.8	64.18	32.83	16.8	23.19	52.47	16.8	27.70	60.22	16.9	27.29	36.74
17.8	29.92	31.79	17.8	64.88	32.77	17.8	24.27	52.41	17.8	29.53	60.02	17.9	27.41	36.56
18.8	30.25	31.79	18.8	65.59	32.73	18.8	25.31	52.36	18.8	31.43	59.83	18.9	27.52	36.37
19.8	30.57	31.78	19.8	66.29	32.71	19.8	26.37	52.27	19.8	33.38	59.66	19.9	27.63	36.18
20.8	30.90	31.76	20.8	67.00	32.72	20.8	27.44	52.18	20.8	35.31	59.52	20.9	27.74	35.97
21.8	31.26	31.74	21.8	67.66	32.73	21.8	28.56	52.08	21.8	37.19	59.38	21.9	27.84	35.75
22.7	31.63	31.72	22.8	68.28	32.77	22.8	29.75	51.98	22.8	39.00	59.27	22.9	27.97	35.52
23.7	32.01	31.71	23.8	68.90	32.80	23.8	31.00	51.88	23.8	40.73	59.17	23.9	28.09	35.29
24.7	32.40	31.71	24.7	69.49	32.81	24.8	32.30	51.80	24.8	42.39	59.06	24.9	28.21	35.07
25.7	32.79	31.75	25.7	70.06	32.81	25.8	33.65	51.73	25.8	44.02	58.94	25.9	28.36	34.87
26.7	33.19	31.79	26.7	70.63	32.82	26.8	35.01	51.68	26.8	45.61	58.83	26.9	28.50	34.67
27.7	33.57	31.86	27.7	71.21	32.82	27.8	36.37	51.66	27.8	47.22	58.70	27.9	28.65	34.49
28.7	33.96	31.95	28.7	71.80	32.80	28.8	37.72	51.65	28.8	48.85	58.56	28.9	28.81	34.34
29.7	34.34	32.06	29.7	72.41	32.78	29.8	39.03	51.66	29.8	50.53	58.43	29.8	28.96	34.19
30.7	34.68	32.16	30.7	73.04	32.77	30.8	40.29	51.68	30.8	52.29	58.29	30.8	29.11	34.07
31.7	35.01	32.26	31.7	73.70	32.76	31.8	41.49	51.70	31.8	54.13	58.14	31.8	29.25	33.96
16.91	+16.88		24.48	-24.46		58.15	+58.14		73.16	-73.15		7.39	+7.33	
17 ^h 58 ^m	41 ^s .809		18 ^h 6 ^m	47 ^s .620		19 ^h 1 ^m	27 ^s .463		19 ^h 29 ^m	16 ^s .746		20 ^h 48 ^m	36 ^s .323	
+86° 36'	51''.12		-87° 39'	51''.38		+89° 1'	7''.53		-89° 13'	21''.02		+82° 13'	43''.34	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "
	21 38	-83 5		22 16	-86 22		22 37	-81 48		23 27	+86 51		23 47	-82 28
	s	"		s	"		s	"		s	"		s	"
0.9	23.86	38.64	0.9	7.56	58.69	1.0	39.83	35.22	1.0	20.94	32.95	1.1	12.84	24.87
1.9	23.92	38.28	1.9	7.60	58.29	1.9	39.83	34.85	2.0	20.91	32.62	2.0	12.79	24.51
2.9	23.98	37.90	2.9	7.65	57.89	2.9	39.84	34.45	3.0	20.88	32.31	3.0	12.73	24.13
3.9	24.06	37.52	3.9	7.72	57.49	3.9	39.87	34.04	4.0	20.87	32.02	4.0	12.69	23.74
4.9	24.15	37.14	4.9	7.81	57.08	4.9	39.90	33.62	5.0	20.84	31.73	5.0	12.65	23.33
5.9	24.25	36.75	5.9	7.93	56.67	5.9	39.93	33.20	6.0	20.80	31.44	6.0	12.63	22.91
6.9	24.37	36.37	6.9	8.07	56.27	6.9	39.98	32.80	7.0	20.75	31.17	7.0	12.62	22.49
7.9	24.50	36.01	7.9	8.23	55.88	7.9	40.04	32.40	8.0	20.69	30.87	8.0	12.62	22.08
8.9	24.63	35.66	8.9	8.41	55.49	8.9	40.10	32.01	9.0	20.61	30.56	9.0	12.62	21.68
9.9	24.74	35.33	9.9	8.57	55.15	9.9	40.16	31.64	10.0	20.54	30.24	10.0	12.63	21.30
10.9	24.85	35.02	10.9	8.73	54.81	10.9	40.21	31.28	11.0	20.48	29.89	11.0	12.64	20.92
11.9	24.96	34.71	11.9	8.86	54.47	11.9	40.26	30.93	12.0	20.46	29.53	12.0	12.63	20.57
12.9	25.06	34.40	12.9	8.98	54.12	12.9	40.31	30.59	13.0	20.48	29.17	13.0	12.61	20.23
13.9	25.15	34.05	13.9	9.08	53.75	13.9	40.35	30.24	14.0	20.51	28.83	14.0	12.58	19.87
14.9	25.23	33.70	14.9	9.17	53.38	14.9	40.38	29.87	14.9	20.59	28.51	15.0	12.55	19.49
15.9	25.32	33.35	15.9	9.29	53.00	15.9	40.41	29.46	15.9	20.68	28.21	16.0	12.53	19.10
16.9	25.43	32.98	16.9	9.42	52.61	16.9	40.43	29.06	16.9	20.77	27.92	17.0	12.52	18.69
17.9	25.56	32.61	17.9	9.58	52.21	17.9	40.49	28.66	17.9	20.85	27.64	18.0	12.52	18.27
18.9	25.69	32.24	18.9	9.77	51.82	18.9	40.57	28.25	18.9	20.91	27.37	19.0	12.53	17.84
19.9	25.84	31.89	19.9	9.98	51.43	19.9	40.65	27.86	19.9	20.95	27.09	19.9	12.56	17.42
20.9	26.00	31.56	20.9	10.20	51.07	20.9	40.74	27.48	20.9	20.99	26.82	20.9	12.59	17.01
21.9	26.15	31.27	21.9	10.43	50.73	21.9	40.82	27.12	21.9	21.01	26.51	21.9	12.63	16.62
22.9	26.29	30.98	22.9	10.64	50.41	22.9	40.91	26.78	22.9	21.04	26.17	22.9	12.67	16.23
23.9	26.43	30.69	23.9	10.84	50.08	23.9	40.99	26.45	23.9	21.10	25.83	23.9	12.70	15.86
24.9	26.55	30.42	24.9	11.04	49.75	24.9	41.06	26.13	24.9	21.18	25.49	24.9	12.73	15.51
25.9	26.68	30.16	25.9	11.23	49.44	25.9	41.13	25.81	25.9	21.28	25.15	25.9	12.75	15.17
26.9	26.80	29.88	26.9	11.40	49.13	26.9	41.19	25.49	26.9	21.40	24.82	26.9	12.76	14.83
27.9	26.92	29.59	27.9	11.56	48.81	27.9	41.25	25.16	27.9	21.54	24.49	27.9	12.77	14.47
28.9	27.04	29.29	28.9	11.73	48.49	28.9	41.31	24.83	28.9	21.71	24.18	28.9	12.78	14.11
29.9	27.16	28.99	29.9	11.91	48.15	29.9	41.38	24.47	29.9	21.88	23.88	29.9	12.80	13.73
30.9	27.29	28.68	30.9	12.10	47.80	30.9	41.46	24.10	30.9	22.07	23.60	30.9	12.82	13.34
31.9	27.43	28.35	31.9	12.31	47.44	31.9	41.54	23.74	31.9	22.25	23.34	31.9	12.85	12.94
8.32	-8.26		15.84	-15.81		7.02	-6.95		18.24	+18.22		7.63	-7.57	
21 ^h 38 ^m	29 ^s .050		22 ^h 16 ^m	20 ^s .949		22 ^h 37 ^m	45 ^s .323		23 ^h 27 ^m	43 ^s .851		23 ^h 47 ^m	20 ^s .032	
-83° 5'	50'' .66		-86° 23'	9'' .03		-81° 48'	43'' .57		+86° 51'	18'' .76		-82° 28'	28'' .42	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
Apr. 0 57	+85 49		Apr. 1 29	+88 52		Apr. 1 41	-85 10		Apr. 4 10	+85 20		Apr. 5 35	+85 9	
0.0	4.19	16.37	0.0	56.87	16.32	0.0	41.91	58.23	0.2	20.72	38.91	0.2	37.95	50.81
1.0	4.22	16.08	1.0	56.83	16.02	1.0	41.79	57.86	1.1	20.56	38.70	1.2	37.75	50.68
2.0	4.26	15.79	2.0	56.79	15.73	2.0	41.69	57.47	2.1	20.41	38.50	2.2	37.55	50.57
3.0	4.29	15.52	3.0	56.71	15.44	3.0	41.61	57.06	3.1	20.26	38.31	3.2	37.35	50.46
4.0	4.30	15.25	4.0	56.58	15.16	4.0	41.55	56.65	4.1	20.10	38.13	4.2	37.15	50.37
5.0	4.30	14.97	5.0	56.41	14.88	5.0	41.49	56.23	5.1	19.93	37.96	5.2	36.94	50.29
6.0	4.29	14.67	6.0	56.22	14.59	6.0	41.44	55.84	6.1	19.75	37.78	6.2	36.72	50.21
6.9	4.28	14.36	7.0	56.06	14.28	7.0	41.40	55.47	7.1	19.55	37.57	7.2	36.49	50.09
7.9	4.28	14.03	8.0	55.92	13.96	8.0	41.37	55.10	8.1	19.35	37.34	8.2	36.25	49.97
8.9	4.32	13.69	9.0	55.87	13.63	9.0	41.32	54.76	9.1	19.16	37.09	9.2	36.01	49.83
9.9	4.38	13.36	10.0	55.91	13.27	10.0	41.25	54.41	10.1	18.98	36.81	10.2	35.77	49.64
10.9	4.47	13.02	11.0	56.04	12.92	11.0	41.17	54.08	11.1	18.83	36.52	11.2	35.55	49.44
11.9	4.57	12.71	12.0	56.27	12.58	12.0	41.08	53.74	12.1	18.71	36.22	12.2	35.35	49.24
12.9	4.69	12.42	13.0	56.54	12.26	13.0	41.01	53.37	13.1	18.61	35.94	13.2	35.18	49.04
13.9	4.80	12.14	14.0	56.81	11.98	14.0	40.95	52.96	14.1	18.51	35.67	14.2	35.02	48.84
14.9	4.91	11.88	14.9	57.03	11.70	15.0	40.89	52.56	15.1	18.41	35.43	15.2	34.86	48.65
15.9	5.01	11.62	15.9	57.22	11.41	16.0	40.84	52.14	16.1	18.31	35.20	16.2	34.70	48.48
16.9	5.09	11.37	16.9	57.37	11.14	17.0	40.84	51.72	17.1	18.19	34.98	17.2	34.53	48.33
17.9	5.15	11.11	17.9	57.46	10.86	17.9	40.84	51.30	18.1	18.07	34.76	18.2	34.35	48.18
18.9	5.23	10.81	18.9	57.54	10.56	18.9	40.85	50.91	19.1	17.93	34.52	19.2	34.17	48.02
19.9	5.31	10.50	19.9	57.64	10.25	19.9	40.86	50.55	20.1	17.79	34.26	20.2	33.97	47.85
20.9	5.39	10.18	20.9	57.78	9.93	20.9	40.86	50.20	21.1	17.64	33.98	21.2	33.75	47.66
21.9	5.48	9.88	21.9	57.98	9.60	21.9	40.87	49.86	22.1	17.50	33.69	22.1	33.54	47.45
22.9	5.58	9.56	22.9	58.23	9.26	22.9	40.87	49.51	23.1	17.37	33.39	23.1	33.34	47.23
23.9	5.72	9.23	23.9	58.54	8.93	23.9	40.87	49.17	24.1	17.26	33.08	24.1	33.14	46.98
24.9	5.86	8.92	24.9	58.93	8.60	24.9	40.85	48.84	25.1	17.16	32.75	25.1	32.96	46.73
25.9	6.04	8.62	25.9	59.38	8.28	25.9	40.83	48.49	26.1	17.07	32.43	26.1	32.79	46.46
26.9	6.21	8.35	26.9	59.87	7.98	26.9	40.82	48.13	27.1	17.01	32.12	27.1	32.64	46.19
27.9	6.39	8.10	27.9	60.38	7.69	27.9	40.81	47.76	28.1	16.97	31.82	28.1	32.50	45.94
28.9	6.58	7.86	28.9	60.89	7.42	28.9	40.81	47.37	29.1	16.93	31.53	29.1	32.38	45.69
29.9	6.76	7.62	29.9	61.37	7.16	29.9	40.82	46.97	30.1	16.89	31.25	30.1	32.27	45.45
30.9	6.92	7.39	30.9	61.83	6.91	30.9	40.85	46.57	31.1	16.86	30.98	31.1	32.16	45.23
13.72	+13.68		50.70	+50.69		11.90	-11.86		12.32	+12.28		11.86	+11.82	
0 ^h 57 ^m 16 ^s .959	1 ^h 30 ^m 42 ^s .307		1 ^h 41 ^m 58 ^s .587	4 ^h 10 ^m 20 ^s .187		5 ^h 35 ^m 31 ^s .554								
+85° 49' 4 ^{''} .72	+88° 52' 2 ^{''} .06		-85° 11' 3 ^{''} .34	+85° 20' 19 ^{''} .62		+85° 9' 32 ^{''} .39								

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensse. Mag. 6.2			C Mensse. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "
	5 45	-84 49		6 46	-80 44		7 2	+87 11		7 13	+82 34		7 15	-86
	s	"		s	"		s	"		s	"		s	"
0.2	52.77	63.75	0.3	50.80	4.41	0.3	51.98	4.52	0.3	63.69	37.51	0.3	51.37	36
1.2	52.47	63.70	1.3	50.64	4.46	1.3	51.58	4.51	1.3	63.55	37.51	1.3	50.90	36
2.2	52.18	63.62	2.3	50.49	4.51	2.3	51.20	4.49	2.3	63.42	37.52	2.3	50.40	36
3.2	51.89	63.54	3.2	50.32	4.52	3.3	50.84	4.48	3.3	63.28	37.53	3.3	49.90	36
4.2	51.60	63.42	4.2	50.16	4.52	4.3	50.48	4.48	4.3	63.15	37.56	4.3	49.40	36
5.2	51.32	63.30	5.2	49.99	4.48	5.3	50.08	4.51	5.3	63.02	37.59	5.3	48.89	36
6.2	51.05	63.16	6.2	49.84	4.44	6.3	49.68	4.54	6.3	62.87	37.62	6.3	48.42	36
7.2	50.81	63.03	7.2	49.69	4.40	7.2	49.26	4.55	7.3	62.70	37.66	7.3	47.96	36
8.2	50.56	62.90	8.2	49.55	4.36	8.2	48.80	4.55	8.3	62.53	37.68	8.3	47.53	36
9.2	50.30	62.80	9.2	49.41	4.35	9.2	48.33	4.51	9.3	62.35	37.66	9.3	47.10	36
10.2	50.06	62.71	10.2	49.27	4.34	10.2	47.85	4.44	10.2	62.17	37.63	10.3	46.68	36
11.2	49.80	62.63	11.2	49.12	4.36	11.2	47.39	4.35	11.2	62.00	37.56	11.2	46.24	36
12.2	49.54	62.55	12.2	48.98	4.38	12.2	46.98	4.26	12.2	61.84	37.48	12.2	45.79	36
13.2	49.26	62.46	13.2	48.83	4.39	13.2	46.58	4.15	13.2	61.70	37.39	13.2	45.33	36
14.2	48.98	62.34	14.2	48.66	4.39	14.2	46.21	4.04	14.2	61.56	37.30	14.2	44.84	36
15.2	48.71	62.20	15.2	48.50	4.36	15.2	45.87	3.95	15.2	61.43	37.21	15.2	44.34	36
16.2	48.44	62.03	16.2	48.34	4.31	16.2	45.52	3.87	16.2	61.31	37.15	16.2	43.84	36
17.2	48.17	61.86	17.2	48.19	4.23	17.2	45.16	3.82	17.2	61.18	37.09	17.2	43.35	36
18.2	47.93	61.67	18.2	48.05	4.13	18.2	44.79	3.76	18.2	61.04	37.04	18.2	42.87	36
19.2	47.69	61.49	19.2	47.89	4.03	19.2	44.39	3.71	19.2	60.90	37.01	19.2	42.41	36
20.2	47.46	61.30	20.2	47.74	3.93	20.2	43.97	3.64	20.2	60.74	36.99	20.2	41.96	36
21.2	47.23	61.12	21.2	47.61	3.82	21.2	43.54	3.56	21.2	60.57	36.94	21.2	41.53	36
22.2	47.01	60.96	22.2	47.48	3.72	22.2	43.10	3.47	22.2	60.40	36.86	22.2	41.12	36
23.2	46.80	60.80	23.2	47.34	3.64	23.2	42.65	3.34	23.2	60.22	36.77	23.2	40.71	36
24.2	46.58	60.64	24.2	47.21	3.56	24.2	42.22	3.21	24.2	60.05	36.65	24.2	40.30	36
25.1	46.36	60.47	25.2	47.08	3.49	25.2	41.80	3.05	25.2	59.89	36.53	25.2	39.90	36
26.1	46.13	60.32	26.2	46.94	3.43	26.2	41.38	2.88	26.2	59.74	36.39	26.2	39.49	36
27.1	45.90	60.17	27.2	46.81	3.36	27.2	41.01	2.71	27.2	59.60	36.25	27.2	39.05	36
28.1	45.67	60.01	28.2	46.66	3.28	28.2	40.67	2.54	28.2	59.46	36.09	28.2	38.60	36
29.1	45.42	59.83	29.2	46.53	3.19	29.2	40.33	2.36	29.2	59.35	35.93	29.2	38.14	36
30.1	45.18	59.61	30.2	46.38	3.07	30.2	40.02	2.20	30.2	59.23	35.79	30.2	37.66	36
31.1	44.96	59.38	31.2	46.24	2.93	31.2	39.72	2.05	31.2	59.11	35.65	31.2	37.19	36
11.11	-11.06		6.21	-6.13		20.36	+20.33		7.74	+7.68		18.55	-18.54	
5 ^h 46 ^m 3 ^s .075			6 ^h 46 ^m 53 ^s .600			7 ^h 2 ^m 33 ^s .206			7 ^h 13 ^m 55 ^s .106			7 ^h 16 ^m 0 ^s .0		
-84° 49' 45".59			-80° 43' 42".15			+87° 10' 49".32			+82° 34' 23".73			-86° 54' 13".		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			♄ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			♄ Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Apr.	h m 8 17	° ' +88 52	Apr.	h m 9 8	° ' -85 20	Apr.	h m 9 25	° ' +81 41	Apr.	h m 9 36	° ' -80 34	Apr.	h m 10 21	° ' +82 58
	s "	"		s "	"		s "	"		s "	"		s "	"
0.3	47.51	59.71	0.4	54.15	36.54	0.4	41.14	29.86	0.4	24.94	47.46	0.4	25.05	35.38
1.3	46.52	59.79	1.4	53.92	36.82	1.4	41.03	30.02	1.4	24.85	47.77	1.4	24.95	35.59
2.3	45.60	59.87	2.4	53.68	37.09	2.4	40.93	30.18	2.4	24.75	48.06	2.4	24.84	35.79
3.3	44.71	59.96	3.3	53.41	37.33	3.4	40.84	30.35	3.4	24.65	48.35	3.4	24.76	36.01
4.3	43.83	60.05	4.3	53.14	37.58	4.4	40.74	30.52	4.4	24.53	48.62	4.4	24.68	36.24
5.3	42.93	60.16	5.3	52.86	37.79	5.4	40.65	30.71	5.4	24.40	48.86	5.4	24.59	36.49
6.3	41.97	60.27	6.3	52.59	37.98	6.4	40.56	30.90	6.4	24.27	49.09	6.4	24.50	36.73
7.3	40.93	60.39	7.3	52.32	38.16	7.4	40.43	31.10	7.4	24.16	49.30	7.4	24.39	36.99
8.3	39.86	60.50	8.3	52.08	38.35	8.3	40.31	31.30	8.4	24.05	49.50	8.4	24.26	37.24
9.3	38.69	60.58	9.3	51.84	38.53	9.3	40.16	31.48	9.4	23.94	49.72	9.4	24.13	37.48
10.3	37.49	60.68	10.3	51.61	38.74	10.3	40.02	31.62	10.3	23.84	49.95	10.4	23.99	37.70
11.3	36.31	60.67	11.3	51.39	38.96	11.3	39.88	31.75	11.3	23.75	50.19	11.4	23.84	37.90
12.3	35.17	60.66	12.3	51.15	39.19	12.3	39.73	31.85	12.3	23.64	50.46	12.4	23.69	38.08
13.3	34.09	60.65	13.3	50.92	39.43	13.3	39.60	31.95	13.3	23.54	50.73	13.4	23.55	38.24
14.3	33.09	60.64	14.3	50.65	39.67	14.3	39.50	32.03	14.3	23.44	51.00	14.4	23.41	38.38
15.3	32.14	60.64	15.3	50.38	39.90	15.3	39.38	32.12	15.3	23.31	51.25	15.4	23.30	38.54
16.3	31.21	60.64	16.3	50.09	40.09	16.3	39.27	32.22	16.3	23.18	51.48	16.4	23.19	38.71
17.3	30.28	60.65	17.3	49.80	40.24	17.3	39.16	32.33	17.3	23.06	51.67	17.4	23.06	38.88
18.3	29.31	60.69	18.3	49.51	40.39	18.3	39.04	32.45	18.3	22.93	51.86	18.4	22.94	39.05
19.3	28.29	60.74	19.3	49.23	40.54	19.3	38.91	32.59	19.3	22.80	52.03	19.4	22.82	39.24
20.3	27.20	60.80	20.3	48.94	40.67	20.3	38.79	32.73	20.3	22.67	52.18	20.4	22.69	39.43
21.3	26.08	60.84	21.3	48.67	40.77	21.3	38.65	32.86	21.3	22.54	52.32	21.4	22.55	39.63
22.3	24.91	60.85	22.3	48.43	40.88	22.3	38.51	32.98	22.3	22.42	52.47	22.3	22.38	39.83
23.3	23.70	60.82	23.3	48.18	41.01	23.3	38.35	33.08	23.3	22.32	52.62	23.3	22.22	40.02
24.3	22.50	60.79	24.3	47.93	41.14	24.3	38.20	33.17	24.3	22.20	52.79	24.3	22.05	40.19
25.3	21.32	60.75	25.3	47.69	41.27	25.3	38.04	33.23	25.3	22.09	52.95	25.3	21.87	40.33
26.2	20.15	60.69	26.3	47.43	41.41	26.3	37.89	33.27	26.3	21.98	53.12	26.3	21.70	40.44
27.2	19.05	60.61	27.3	47.17	41.57	27.3	37.74	33.31	27.3	21.86	53.29	27.3	21.54	40.55
28.2	18.00	60.53	28.3	46.91	41.72	28.3	37.59	33.32	28.3	21.74	53.47	28.3	21.39	40.64
29.2	17.02	60.45	29.3	46.63	41.87	29.3	37.47	33.33	29.3	21.61	53.65	29.3	21.24	40.73
30.2	16.08	60.36	30.3	46.34	42.01	30.3	37.35	33.34	30.3	21.48	53.82	30.3	21.10	40.81
31.2	15.19	60.28	31.3	46.04	42.11	31.3	37.24	33.37	31.3	21.35	53.96	31.3	20.97	40.89
51.32	+51.31		12.32	-12.28		6.92	+6.85		6.11	-6.03		8.18	+8.12	
8 ^h 16 ^m 48 ^s .125			9 ^h 8 ^m 49 ^s .775			9 ^h 25 ^m 30 ^s .501			9 ^h 36 ^m 20 ^s .688			10 ^h 21 ^m 12 ^s .394		
+88° 52' 49".08			-85° 20' 12".12			+81° 41' 25".82			-80° 34' 23".04			+82° 58' 35".87		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			33 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Apr. 11 0	h m ° ' "	-84 9	Apr. 12 14	h m ° ' "	+88 9	Apr. 12 46	h m ° ' "	-84 40	Apr. 12 48	h m ° ' "	+83 51	Apr. 13 27	h m ° ' "	-85 22
0.4	5.79	30.37	0.5	67.50	6.94	0.5	30.17	54.07	0.5	42.83	18.54	0.5	44.42	8.90
1.4	5.72	30.75	1.5	67.35	7.23	1.5	30.22	54.47	1.5	42.82	18.83	1.5	44.53	9.28
2.4	5.63	31.13	2.5	67.22	7.50	2.5	30.26	54.88	2.5	42.82	19.12	2.5	44.63	9.69
3.4	5.53	31.53	3.5	67.12	7.76	3.5	30.29	55.30	3.5	42.81	19.39	3.5	44.72	10.11
4.4	5.41	31.90	4.5	67.03	8.04	4.5	30.29	55.72	4.5	42.82	19.66	4.5	44.79	10.51
5.4	5.29	32.24	5.5	66.95	8.32	5.5	30.28	56.12	5.5	42.82	19.95	5.5	44.83	10.92
6.4	5.15	32.56	6.5	66.87	8.63	6.5	30.25	56.50	6.5	42.83	20.26	6.5	44.87	11.29
7.4	5.02	32.87	7.5	66.75	8.95	7.5	30.23	56.87	7.5	42.83	20.58	7.5	44.90	11.67
8.4	4.90	33.16	8.5	66.58	9.28	8.5	30.22	57.21	8.5	42.81	20.92	8.5	44.93	12.01
9.4	4.80	33.46	9.5	66.36	9.62	9.5	30.21	57.55	9.5	42.77	21.28	9.5	44.97	12.35
10.4	4.71	33.77	10.5	66.08	9.96	10.5	30.22	57.89	10.5	42.73	21.62	10.5	45.02	12.68
11.4	4.62	34.10	11.5	65.75	10.26	11.5	30.25	58.25	11.5	42.67	21.96	11.5	45.11	13.03
12.4	4.53	34.43	12.5	65.42	10.54	12.5	30.27	58.61	12.5	42.59	22.27	12.5	45.20	13.39
13.4	4.44	34.79	13.4	65.08	10.81	13.5	30.30	58.99	13.5	42.51	22.56	13.5	45.28	13.77
14.4	4.33	35.16	14.4	64.76	11.07	14.5	30.30	59.39	14.5	42.46	22.84	14.5	45.35	14.18
15.4	4.20	35.50	15.4	64.48	11.31	15.5	30.30	59.80	15.5	42.40	23.11	15.5	45.40	14.59
16.4	4.06	35.84	16.4	64.23	11.56	16.5	30.27	60.21	16.5	42.35	23.37	16.5	45.43	14.99
17.4	3.91	36.16	17.4	63.99	11.82	17.5	30.23	60.60	17.5	42.31	23.64	17.5	45.43	15.39
18.4	3.76	36.45	18.4	63.76	12.09	18.5	30.17	60.98	18.5	42.28	23.93	18.5	45.43	15.77
19.4	3.60	36.74	19.4	63.50	12.38	19.5	30.11	61.34	19.5	42.23	24.24	19.5	45.41	16.15
20.4	3.45	36.98	20.4	63.23	12.66	20.5	30.04	61.68	20.5	42.18	24.55	20.5	45.38	16.49
21.4	3.30	37.23	21.4	62.92	12.96	21.4	29.98	62.00	21.5	42.11	24.86	21.5	45.36	16.83
22.4	3.15	37.48	22.4	62.57	13.25	22.4	29.92	62.32	22.4	42.03	25.17	22.5	45.35	17.16
23.4	3.01	37.73	23.4	62.17	13.55	23.4	29.87	62.64	23.4	41.95	25.50	23.5	45.34	17.49
24.4	2.89	38.00	24.4	61.75	13.83	24.4	29.82	62.96	24.4	41.85	25.83	24.5	45.34	17.81
25.4	2.76	38.26	25.4	61.29	14.10	25.4	29.79	63.28	25.4	41.74	26.15	25.5	45.34	18.14
26.4	2.63	38.52	26.4	60.83	14.36	26.4	29.75	63.61	26.4	41.63	26.43	26.5	45.35	18.48
27.4	2.50	38.80	27.4	60.36	14.60	27.4	29.71	63.97	27.4	41.52	26.71	27.5	45.36	18.83
28.4	2.36	39.09	28.4	59.89	14.83	28.4	29.68	64.32	28.4	41.41	26.97	28.5	45.37	19.19
29.4	2.21	39.38	29.4	59.45	15.03	29.4	29.64	64.68	29.4	41.31	27.21	29.5	45.38	19.57
30.4	2.05	39.66	30.4	59.03	15.22	30.4	29.57	65.05	30.4	41.21	27.44	30.5	45.35	19.96
31.3	1.88	39.93	31.4	58.64	15.41	31.4	29.49	65.42	31.4	41.11	27.67	31.5	45.32	20.36
9.83	-9.78		31.03	+31.01		10.79	-10.75		9.34	+9.29		12.39	-12.35	
10 ^h 59 ^m 54 ^s .915			12 ^h 14 ^m 28 ^s .804			12 ^h 46 ^m 13 ^s .131			12 ^h 48 ^m 30 ^s .862			13 ^h 27 ^m 23 ^s .749		
-84° 9' 9".97			+88° 9' 16".14			-84° 40' 41".95			+83° 51' 30".88			-85° 22' 0".86		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Apr.	h m	° '	Apr.	h m	° '	Apr.	h m	° '	Apr.	h m	° '	Apr.	h m	° '
	14 13	-83 17		15 3	+87 32		15 24	-84 11		16 54	+82 10		17 16	-80 46
	s	"		s	"		s	"		s	"		s	"
0.6	52.48	41.42	0.6	34.86	37.65	0.6	27.31	39.07	0.7	19.98	6.33	0.7	15.57	56.70
1.6	52.60	41.78	1.6	35.07	37.92	1.6	27.51	39.33	1.7	20.11	6.52	1.7	15.74	56.80
2.6	52.72	42.15	2.6	35.29	38.16	2.6	27.72	39.62	2.7	20.24	6.69	2.7	15.92	56.93
3.6	52.82	42.53	3.6	35.52	38.41	3.6	27.92	39.94	3.7	20.36	6.84	3.7	16.10	57.07
4.6	52.92	42.92	4.6	35.76	38.65	4.6	28.10	40.26	4.7	20.49	6.99	4.7	16.27	57.25
5.6	53.00	43.30	5.6	36.03	38.88	5.6	28.27	40.59	5.7	20.62	7.14	5.7	16.42	57.42
6.6	53.06	43.67	6.6	36.30	39.13	6.6	28.41	40.91	6.7	20.76	7.28	6.7	16.58	57.59
7.5	53.12	44.01	7.6	36.57	39.41	7.6	28.55	41.20	7.7	20.90	7.46	7.7	16.70	57.74
8.5	53.19	44.34	8.6	36.82	39.71	8.6	28.69	41.48	8.7	21.04	7.65	8.7	16.84	57.89
9.5	53.26	44.65	9.6	37.03	40.04	9.6	28.84	41.76	9.7	21.18	7.88	9.7	16.97	58.03
10.5	53.34	44.95	10.6	37.22	40.37	10.6	28.99	42.02	10.7	21.31	8.12	10.7	17.11	58.15
11.5	53.44	45.27	11.6	37.36	40.71	11.6	29.16	42.28	11.6	21.41	8.39	11.7	17.26	58.26
12.5	53.53	45.60	12.6	37.47	41.04	12.6	29.33	42.55	12.6	21.52	8.65	12.7	17.43	58.38
13.5	53.64	45.96	13.6	37.56	41.35	13.6	29.51	42.83	13.6	21.63	8.90	13.7	17.58	58.51
14.5	53.74	46.33	14.6	37.64	41.64	14.6	29.69	43.15	14.6	21.73	9.14	14.7	17.76	58.66
15.5	53.82	46.72	15.6	37.74	41.93	15.6	29.87	43.48	15.6	21.84	9.37	15.7	17.92	58.84
16.5	53.90	47.10	16.6	37.86	42.19	16.6	30.02	43.84	16.6	21.94	9.58	16.7	18.09	59.03
17.5	53.95	47.49	17.6	37.99	42.46	17.6	30.16	44.18	17.6	22.04	9.78	17.6	18.23	59.25
18.5	53.99	47.87	18.6	38.15	42.74	18.6	30.29	44.51	18.6	22.15	9.96	18.6	18.37	59.47
19.5	54.02	48.24	19.6	38.31	43.04	19.6	30.39	44.85	19.6	22.26	10.19	19.6	18.50	59.67
20.5	54.05	48.57	20.5	38.46	43.36	20.6	30.49	45.17	20.6	22.38	10.42	20.6	18.62	59.87
21.5	54.07	48.91	21.5	38.61	43.68	21.6	30.58	45.49	21.6	22.50	10.67	21.6	18.74	60.07
22.5	54.10	49.24	22.5	38.71	44.02	22.6	30.69	45.78	22.6	22.60	10.96	22.6	18.84	60.25
23.5	54.14	49.56	23.5	38.80	44.36	23.6	30.79	46.07	23.6	22.70	11.25	23.6	18.96	60.42
24.5	54.18	49.87	24.5	38.86	44.72	24.6	30.90	46.34	24.6	22.81	11.56	24.6	19.08	60.59
25.5	54.22	50.18	25.5	38.90	45.07	25.5	31.01	46.62	25.6	22.90	11.86	25.6	19.20	60.74
26.5	54.26	50.50	26.5	38.90	45.41	26.5	31.13	46.91	26.6	22.99	12.17	26.6	19.33	60.91
27.5	54.31	50.86	27.5	38.88	45.74	27.5	31.26	47.22	27.6	23.06	12.48	27.6	19.47	61.09
28.5	54.36	51.21	28.5	38.85	46.07	28.5	31.38	47.52	28.6	23.14	12.78	28.6	19.61	61.28
29.5	54.41	51.59	29.5	38.82	46.38	29.5	31.51	47.85	29.6	23.20	13.06	29.6	19.75	61.49
30.5	54.46	51.97	30.5	38.80	46.66	30.5	31.63	48.21	30.6	23.26	13.34	30.6	19.90	61.72
31.5	54.48	52.35	31.5	38.79	46.94	31.5	31.73	48.57	31.6	23.34	13.60	31.6	20.03	61.98
8.57	-8.51		23.35	+23.32		9.89	-9.84		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m	37°.066		15 ^h 3 ^m	21°.809		15 ^h 24 ^m	9°.966		16 ^h 54 ^m	19°.238		17 ^h 16 ^m	6°.064	
-83° 17'	37''.78		+87° 32'	56''.60		-84° 11'	42''.92		+82° 10'	27''.09		-80° 47'	10''.43	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Apr.	h m s "	° ' "	Apr.	h m s "	° ' "	Apr.	h m s "	° ' "	Apr.	h m s "	° ' "	Apr.	h m s "	° ' "
	17 58	+86 36		18 7	-87 39		19 0	+89 0		19 29	-89 12		20 48	+82 13
0.7	35.01	32.26	0.7	13.70	32.76	0.8	41.49	51.70	0.8	54.13	58.14	0.8	29.25	33.96
1.7	35.33	32.36	1.7	14.39	32.79	1.8	42.63	51.71	1.8	56.06	58.00	1.8	29.40	33.85
2.7	35.65	32.46	2.7	15.09	32.82	2.8	43.74	51.72	2.8	58.05	57.90	2.8	29.54	33.74
3.7	35.97	32.54	3.7	15.78	32.89	3.8	44.81	51.73	3.8	60.07	57.81	3.8	29.68	33.61
4.7	36.29	32.60	4.7	16.45	32.98	4.8	45.91	51.73	4.8	62.09	57.75	4.8	29.80	33.49
5.7	36.62	32.65	5.7	17.11	33.07	5.8	47.06	51.72	5.8	64.06	57.70	5.8	29.93	33.35
6.7	36.97	32.72	6.7	17.72	33.18	6.8	48.27	51.71	6.8	65.93	57.65	6.8	30.07	33.20
7.7	37.33	32.81	7.7	18.30	33.27	7.7	49.55	51.70	7.8	67.71	57.62	7.8	30.23	33.06
8.7	37.69	32.94	8.7	18.86	33.35	8.7	50.88	51.72	8.8	69.40	57.57	8.8	30.38	32.92
9.7	38.05	33.07	9.7	19.41	33.42	9.7	52.23	51.76	9.8	71.06	57.49	9.8	30.55	32.82
10.7	38.41	33.25	10.7	19.98	33.47	10.7	53.56	51.85	10.8	72.72	57.42	10.8	30.72	32.75
11.7	38.74	33.43	11.7	20.58	33.51	11.7	54.84	51.93	11.8	74.44	57.34	11.8	30.89	32.70
12.7	39.04	33.63	12.7	21.21	33.55	12.7	56.05	52.03	12.8	76.26	57.25	12.8	31.06	32.67
13.7	39.33	33.82	13.7	21.85	33.60	13.7	57.18	52.15	13.8	78.17	57.15	13.8	31.23	32.65
14.7	39.61	33.99	14.7	22.51	33.69	14.7	58.24	52.25	14.7	80.16	57.09	14.8	31.38	32.62
15.7	39.88	34.14	15.7	23.18	33.79	15.7	59.27	52.34	15.7	82.20	57.04	15.8	31.52	32.59
16.7	40.16	34.29	16.7	23.85	33.91	16.7	60.30	52.43	16.7	84.22	57.02	16.8	31.67	32.54
17.7	40.45	34.43	17.7	24.48	34.06	17.7	61.38	52.49	17.7	86.20	57.02	17.8	31.81	32.49
18.7	40.76	34.57	18.7	25.07	34.21	18.7	62.50	52.55	18.7	88.10	57.03	18.8	31.96	32.42
19.7	41.07	34.72	19.7	25.63	34.36	19.7	63.69	52.61	19.7	89.91	57.06	19.8	32.11	32.36
20.7	41.39	34.89	20.7	26.16	34.50	20.7	64.90	52.69	20.7	91.65	57.08	20.8	32.28	32.29
21.7	41.71	35.07	21.7	26.68	34.64	21.7	66.16	52.79	21.7	93.33	57.09	21.8	32.45	32.23
22.7	42.04	35.27	22.7	27.18	34.77	22.7	67.42	52.90	22.7	94.94	57.11	22.8	32.62	32.19
23.7	42.36	35.49	23.7	27.69	34.89	23.7	68.69	53.03	23.7	96.56	57.12	23.8	32.79	32.18
24.7	42.66	35.72	24.7	28.19	35.00	24.7	69.93	53.17	24.7	98.18	57.12	24.8	32.96	32.18
25.7	42.95	35.96	25.7	28.73	35.11	25.7	71.13	53.35	25.7	99.83	57.10	25.8	33.14	32.21
26.7	43.22	36.23	26.7	29.27	35.21	26.7	72.27	53.54	26.7	101.54	57.09	26.8	33.32	32.24
27.7	43.46	36.47	27.7	29.83	35.33	27.7	73.35	53.73	27.7	103.33	57.08	27.8	33.49	32.29
28.6	43.70	36.72	28.7	30.41	35.47	28.7	74.35	53.91	28.7	105.17	57.08	28.8	33.64	32.34
29.6	43.93	36.96	29.7	31.01	35.62	29.7	75.30	54.09	29.7	107.08	57.11	29.8	33.79	32.40
30.6	44.14	37.20	30.8	31.61	35.79	30.7	76.20	54.25	30.7	109.04	57.15	30.8	33.95	32.46
31.6	44.36	37.41	31.6	32.19	35.97	31.7	77.11	54.40	31.7	110.98	57.20	31.8	34.10	32.50
16.91	+16.88		24.49	-24.47		58.14	+58.14		73.07	-73.06		7.39	+7.32	
17 ^h 58 ^m	41° 8.809		18 ^h 6 ^m	47° 6.20		19 ^h 1 ^m	27° 46.3		19 ^h 29 ^m	16° 7.746		20 ^h 48 ^m	36° 3.323	
+86° 36'	51° 12'		-87° 39'	51° 38'		+89° 1'	7° 53'		-89° 13'	21° 02'		+82° 13'	43° 34'	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "
	21 38	-83 5		22 16	-86 22		22 37	-81 48		23 27	+86 51		23 47	-82 28
	s	"		s	"		s	"		s	"		s	"
0.9	27.43	28.35	0.9	12.31	47.44	0.9	41.54	23.74	0.9	22.25	23.34	0.9	12.85	12.04
1.9	27.60	28.02	1.9	12.54	47.10	1.9	41.63	23.38	1.9	22.42	23.08	1.9	12.89	12.53
2.9	27.77	27.72	2.9	12.81	46.76	2.9	41.73	23.01	2.9	22.58	22.83	2.9	12.93	12.11
3.9	27.95	27.43	3.9	13.08	46.42	3.9	41.84	22.65	3.9	22.72	22.57	3.9	12.99	11.70
4.9	28.14	27.16	4.9	13.36	46.10	4.9	41.97	22.31	4.9	22.86	22.30	4.9	13.06	11.31
5.9	28.31	26.91	5.9	13.66	45.81	5.9	42.09	21.98	5.9	22.99	22.02	5.9	13.14	10.93
6.9	28.48	26.67	6.9	13.94	45.53	6.9	42.20	21.67	6.9	23.13	21.74	6.9	13.22	10.56
7.9	28.64	26.44	7.9	14.20	45.26	7.9	42.30	21.38	7.9	23.29	21.45	7.9	13.28	10.21
8.9	28.79	26.20	8.9	14.45	45.00	8.9	42.40	21.09	8.9	23.48	21.15	8.9	13.34	9.88
9.9	28.93	25.96	9.9	14.68	44.72	9.9	42.48	20.80	9.9	23.71	20.85	9.9	13.40	9.55
10.8	29.07	25.70	10.9	14.89	44.42	10.9	42.57	20.49	10.9	23.97	20.57	10.9	13.43	9.19
11.8	29.22	25.44	11.9	15.11	44.10	11.9	42.66	20.17	11.9	24.24	20.32	11.9	13.47	8.82
12.8	29.39	25.16	12.9	15.35	43.77	12.9	42.76	19.83	12.9	24.53	20.08	12.9	13.52	8.45
13.8	29.56	24.88	13.9	15.61	43.45	13.9	42.87	19.48	13.9	24.80	19.87	13.9	13.58	8.06
14.8	29.74	24.60	14.9	15.90	43.13	14.9	42.99	19.13	14.9	25.06	19.66	14.9	13.65	7.66
15.8	29.92	24.33	15.9	16.21	42.83	15.9	43.12	18.79	15.9	25.30	19.45	15.9	13.73	7.27
16.8	30.11	24.08	16.9	16.53	42.55	16.9	43.26	18.48	16.9	25.52	19.24	16.9	13.83	6.88
17.8	30.32	23.87	17.9	16.86	42.28	17.9	43.39	18.19	17.9	25.73	19.03	17.9	13.93	6.51
18.8	30.52	23.68	18.9	17.19	42.04	18.9	43.52	17.91	18.9	25.94	18.81	18.9	14.03	6.17
19.8	30.71	23.50	19.9	17.50	41.80	19.9	43.66	17.64	19.9	26.17	18.55	19.9	14.13	5.83
20.8	30.89	23.32	20.8	17.80	41.58	20.9	43.78	17.39	20.9	26.41	18.29	20.9	14.23	5.51
21.8	31.06	23.15	21.8	18.09	41.36	21.9	43.90	17.15	21.9	26.68	18.03	21.9	14.32	5.21
22.8	31.22	22.98	22.8	18.37	41.13	22.9	44.02	16.91	22.9	26.97	17.78	22.9	14.40	4.91
23.8	31.37	22.81	23.8	18.64	40.90	23.9	44.12	16.65	23.9	27.28	17.54	23.9	14.48	4.61
24.8	31.52	22.62	24.8	18.90	40.67	24.9	44.23	16.40	24.9	27.60	17.31	24.9	14.55	4.29
25.8	31.69	22.42	25.8	19.17	40.44	25.8	44.34	16.14	25.9	27.94	17.11	25.9	14.63	3.97
26.8	31.87	22.22	26.8	19.44	40.20	26.8	44.46	15.87	26.9	28.29	16.91	26.9	14.71	3.65
27.8	32.05	22.01	27.8	19.74	39.95	27.8	44.58	15.58	27.9	28.64	16.73	27.9	14.80	3.32
28.8	32.24	21.80	28.8	20.05	39.70	28.8	44.71	15.30	28.9	28.98	16.58	28.9	14.89	2.97
29.8	32.44	21.60	29.8	20.38	39.45	29.8	44.86	15.01	29.9	29.29	16.43	29.9	15.00	2.61
30.8	32.65	21.41	30.8	20.74	39.21	30.8	45.01	14.74	30.9	29.59	16.29	30.9	15.12	2.26
31.8	32.87	21.25	31.8	21.11	39.00	31.8	45.17	14.49	31.9	29.88	16.15	31.9	15.25	1.92
8.31	-8.25		15.83	-15.80		7.02	-6.94		18.23	+18.20		7.63	-7.56	
21 ^h 38 ^m	29°.050		22 ^h 16 ^m	20°.949		22 ^h 37 ^m	45°.323		23 ^h 27 ^m	43°.851		23 ^h 47 ^m	20°.032	
-83° 5'	50''.66		-86° 23'	9''.03		-81° 48'	43''.57		+86° 51'	18''.76		-82° 28'	28''.42	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursae Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m	s	May	h m	s	May	h m	s	May	h m	s	May	h m	s
	0 57	+85 49		1 30	+88 51		1 41	-85 10		4 10	+85 20		5 35	+85 9
	s	"		s	"		s	"		s	"		s	"
0.9	6.92	7.39	0.9	1.83	66.91	0.9	40.85	46.57	1.1	16.86	30.98	1.1	32.16	45.23
1.9	7.06	7.17	1.9	2.24	66.66	1.9	40.90	46.16	2.1	16.81	30.71	2.1	32.04	45.02
2.9	7.20	6.94	2.9	2.61	66.41	2.9	40.97	45.76	3.1	16.75	30.45	3.1	31.92	44.81
3.9	7.34	6.70	3.9	2.97	66.14	3.9	41.04	45.38	4.1	16.68	30.19	4.1	31.78	44.59
4.9	7.49	6.43	4.9	3.36	65.86	4.9	41.11	45.04	5.1	16.61	29.91	5.1	31.63	44.37
5.9	7.65	6.17	5.9	3.80	65.57	5.9	41.18	44.71	6.1	16.54	29.60	6.1	31.48	44.11
6.9	7.83	5.90	6.9	4.33	65.27	6.9	41.23	44.39	7.0	16.48	29.28	7.1	31.33	43.83
7.9	8.05	5.65	7.9	4.95	64.97	7.9	41.27	44.07	8.0	16.44	28.95	8.1	31.19	43.53
8.9	8.28	5.40	8.9	5.67	64.68	8.9	41.30	43.74	9.0	16.42	28.59	9.1	31.08	43.21
9.9	8.52	5.17	9.9	6.45	64.41	9.9	41.32	43.40	10.0	16.44	28.25	10.1	30.99	42.90
10.9	8.77	4.97	10.9	7.24	64.17	10.9	41.36	43.04	11.0	16.47	27.93	11.1	30.93	42.59
11.9	9.02	4.78	11.9	8.00	63.95	11.9	41.41	42.66	12.0	16.50	27.63	12.1	30.88	42.30
12.9	9.26	4.61	12.9	8.73	63.75	12.9	41.47	42.27	13.0	16.54	27.35	13.1	30.82	42.03
13.9	9.47	4.44	13.9	9.39	63.56	13.9	41.56	41.88	14.0	16.57	27.09	14.1	30.76	41.78
14.9	9.67	4.27	14.9	10.00	63.34	14.9	41.66	41.51	15.0	16.58	26.83	15.1	30.69	41.53
15.9	9.87	4.09	15.9	10.60	63.12	15.9	41.78	41.15	16.0	16.59	26.56	16.1	30.61	41.29
16.9	10.06	3.91	16.9	11.17	62.90	16.9	41.90	40.81	17.0	16.58	26.29	17.1	30.53	41.04
17.9	10.25	3.70	17.9	11.79	62.66	17.9	42.01	40.47	18.0	16.57	25.98	18.1	30.43	40.77
18.9	10.47	3.48	18.9	12.45	62.39	18.9	42.12	40.16	19.0	16.55	25.67	19.1	30.33	40.47
19.9	10.70	3.28	19.9	13.15	62.12	19.9	42.23	39.87	20.0	16.55	25.35	20.1	30.24	40.16
20.9	10.93	3.07	20.9	13.92	61.87	20.9	42.34	39.58	21.0	16.56	25.03	21.1	30.16	39.85
21.9	11.20	2.86	21.9	14.75	61.63	21.9	42.44	39.29	22.0	16.59	24.68	22.1	30.09	39.53
22.9	11.47	2.67	22.9	15.64	61.39	22.9	42.53	39.00	23.0	16.64	24.34	23.1	30.04	39.20
23.9	11.76	2.49	23.9	16.57	61.18	23.9	42.62	38.70	24.0	16.71	24.01	24.1	29.99	38.86
24.9	12.04	2.34	24.9	17.51	60.98	24.9	42.71	38.39	25.0	16.79	23.69	25.1	29.96	38.53
25.9	12.33	2.21	25.9	18.46	60.80	25.9	42.81	38.06	25.9	16.88	23.38	26.1	29.95	38.22
26.9	12.61	2.10	26.9	19.41	60.63	26.9	42.93	37.73	26.9	16.98	23.10	27.1	29.95	37.92
27.9	12.89	1.99	27.9	20.30	60.48	27.9	43.06	37.39	27.9	17.08	22.84	28.0	29.97	37.63
28.9	13.15	1.89	28.9	21.16	60.34	28.9	43.20	37.04	28.9	17.18	22.58	29.0	29.98	37.37
29.9	13.39	1.79	29.9	21.96	60.21	29.9	43.37	36.71	29.9	17.26	22.32	30.0	29.98	37.10
30.9	13.63	1.66	30.9	22.74	60.06	30.9	43.54	36.40	30.9	17.32	22.06	31.0	29.96	36.83
31.8	13.86	1.54	31.9	23.51	59.89	31.9	43.71	36.11	31.9	17.38	21.80	32.0	29.93	36.55
13.71 +13.68			50.60 +50.59			11.90 -11.86			12.31 +12.27			11.86 +11.81		
0 ^h 57 ^m 16 ^s .959			1 ^h 30 ^m 42 ^s .307			1 ^h 41 ^m 58 ^s .587			4 ^h 10 ^m 20 ^s .187			5 ^h 35 ^m 31 ^s .554		
+85° 49' 4".72			+88° 52' 2".06			-85° 11' 3".34			+85° 20' 19".62			+85° 9' 32".39		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensae. Mag. 6.2			C Mensae. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m	° ' "	May	h m	° ' "	May	h m	° ' "	May	h m	° ' "	May	h m	° ' "
	5 45	-84 49		6 46	-80 43		7 2	+87 10		7 13	+82 34		7 15	-86 54
	s	"		s	"		s	"		s	"		s	"
1.1	44.96	59.38	1.2	46.24	62.93	1.2	39.72	62.05	1.2	59.11	35.65	1.2	37.19	36.30
2.1	44.73	59.14	2.2	46.09	62.76	2.2	39.42	61.91	2.2	59.01	35.53	2.2	36.72	36.18
3.1	44.51	58.88	3.2	45.95	62.59	3.2	39.11	61.77	3.2	58.89	35.43	3.2	36.27	36.06
4.1	44.32	58.62	4.2	45.82	62.41	4.2	38.75	61.65	4.2	58.76	35.31	4.2	35.85	35.94
5.1	44.12	58.38	5.2	45.70	62.23	5.2	38.39	61.51	5.2	58.62	35.18	5.2	35.44	35.81
6.1	43.94	58.16	6.2	45.58	62.06	6.2	38.01	61.34	6.2	58.48	35.05	6.2	35.06	35.70
7.1	43.76	57.97	7.2	45.46	61.92	7.2	37.63	61.14	7.2	58.32	34.87	7.2	34.68	35.60
8.1	43.57	57.77	8.2	45.34	61.80	8.2	37.26	60.92	8.2	58.18	34.68	8.2	34.31	35.53
9.1	43.38	57.58	9.2	45.22	61.70	9.2	36.92	60.68	9.2	58.05	34.45	9.2	33.94	35.48
10.1	43.19	57.38	10.1	45.10	61.58	10.2	36.62	60.43	10.2	57.93	34.22	10.2	33.61	35.40
11.1	42.98	57.17	11.1	44.97	61.46	11.2	36.34	60.18	11.2	57.83	34.00	11.2	33.10	35.32
12.1	42.78	56.93	12.1	44.84	61.30	12.2	36.10	59.94	12.2	57.75	33.78	12.2	32.65	35.23
13.1	42.57	56.66	13.1	44.71	61.12	13.2	35.87	59.72	13.2	57.67	33.58	13.2	32.21	35.10
14.1	42.37	56.38	14.1	44.58	60.93	14.1	35.64	59.52	14.2	57.58	33.39	14.2	31.78	34.96
15.1	42.18	56.10	15.1	44.45	60.71	15.1	35.40	59.32	15.2	57.49	33.21	15.2	31.36	34.78
16.1	42.01	55.81	16.1	44.33	60.48	16.1	35.13	59.13	16.2	57.39	33.05	16.2	30.95	34.60
17.1	41.86	55.52	17.1	44.23	60.26	17.1	34.85	58.94	17.1	57.27	32.87	17.2	30.58	34.43
18.1	41.72	55.23	18.1	44.13	60.03	18.1	34.64	58.73	18.1	57.15	32.69	18.1	30.22	34.25
19.1	41.58	54.97	19.1	44.02	59.80	19.1	34.24	58.51	19.1	57.03	32.49	19.1	29.88	34.07
20.1	41.44	54.71	20.1	43.92	59.59	20.1	33.93	58.27	20.1	56.91	32.27	20.1	29.55	33.89
21.1	41.30	54.47	21.1	43.82	59.38	21.1	33.62	58.01	21.1	56.79	32.04	21.1	29.22	33.74
22.1	41.16	54.22	22.1	43.73	59.19	22.1	33.34	57.74	22.1	56.69	31.77	22.1	28.90	33.59
23.1	41.03	53.97	23.1	43.63	59.00	23.1	33.08	57.45	23.1	56.59	31.52	23.1	28.57	33.46
24.1	40.88	53.73	24.1	43.53	58.82	24.1	32.84	57.16	24.1	56.49	31.26	24.1	28.24	33.32
25.1	40.73	53.47	25.1	43.43	58.63	25.1	32.63	56.87	25.1	56.41	30.98	25.1	27.88	33.17
26.1	40.59	53.20	26.1	43.33	58.42	26.1	32.45	56.58	26.1	56.35	30.70	26.1	27.53	33.02
27.1	40.44	52.92	27.1	43.23	58.20	27.1	32.30	56.29	27.1	56.29	30.43	27.1	27.16	32.86
28.1	40.29	52.62	28.1	43.12	57.98	28.1	32.15	56.02	28.1	56.24	30.18	28.1	26.79	32.67
29.1	40.14	52.30	29.1	43.02	57.71	29.1	32.02	55.79	29.1	56.18	29.96	29.1	26.42	32.45
30.1	40.01	51.97	30.1	42.93	57.42	30.1	31.86	55.55	30.1	56.13	29.74	30.1	26.06	32.21
31.0	39.92	51.63	31.1	42.83	57.12	31.1	31.69	55.31	31.1	56.06	29.52	31.1	25.73	31.96
32.0	39.82	51.28	32.1	42.75	56.84	32.1	31.61	55.07	32.1	55.98	29.30	32.1	25.42	31.71
11.10	-11.06		6.21	-6.13		20.35	+20.32		7.74	+7.67		18.55	-18.52	
5 ^h 46 ^m	3°.075		6 ^h 46 ^m	53°.600		7 ^h 2 ^m	33°.206		7 ^h 13 ^m	55°.106		7 ^h 16 ^m	0°.004	
-84° 49'	45''.59		-80° 43'	42''.15		+87° 10'	49''.32		+82° 34'	23''.73		-86° 54'	13''.24	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamaeleontis. Mag. 5.2			30 H. Camelopardalis. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
May	h m	° '	May	h m	° '	May	h m	° '	May	h m	° '	May	h m	° '
	8 16	+88 52		9 8	-85 20		9 25	+81 41		9 36	-80 34		10 21	+81 41
	s	"		s	"		s	"		s	"		s	"
1.2	75.19	60.28	1.3	46.04	42.11	1.3	37.24	33.37	1.3	21.35	53.96	1.3	20.97	40.00
2.2	74.30	60.23	2.3	45.73	42.21	2.3	37.13	33.40	2.3	21.21	54.07	2.3	20.84	40.00
3.2	73.38	60.18	3.3	45.43	42.27	3.3	37.00	33.44	3.3	21.07	54.18	3.3	20.70	41.00
4.2	72.39	60.13	4.3	45.14	42.31	4.3	36.87	33.49	4.3	20.93	54.27	4.3	20.56	41.00
5.2	71.35	60.08	5.3	44.85	42.35	5.3	36.73	33.54	5.3	20.79	54.35	5.3	20.40	41.00
6.2	70.23	60.01	6.3	44.58	42.40	6.3	36.59	33.58	6.3	20.66	54.43	6.3	20.23	41.00
7.2	69.10	59.91	7.3	44.34	42.46	7.3	36.41	33.59	7.3	20.56	54.51	7.3	20.05	41.00
8.2	67.95	59.77	8.3	44.09	42.54	8.3	36.27	33.58	8.3	20.44	54.61	8.3	19.87	41.00
9.2	66.86	59.61	9.2	43.84	42.62	9.3	36.12	33.55	9.3	20.33	54.71	9.3	19.68	41.00
10.2	65.84	59.44	10.2	43.58	42.72	10.3	35.97	33.49	10.3	20.20	54.85	10.3	19.49	41.00
11.2	64.95	59.27	11.2	43.31	42.81	11.3	35.84	33.41	11.3	20.08	54.98	11.3	19.34	41.00
12.2	64.03	59.10	12.2	43.02	42.89	12.3	35.71	33.34	12.3	19.95	55.10	12.3	19.19	41.00
13.2	63.21	58.96	13.2	42.73	42.95	13.3	35.60	33.28	13.3	19.81	55.20	13.3	19.05	41.00
14.2	62.42	58.82	14.2	42.43	43.00	14.2	35.49	33.23	14.3	19.67	55.28	14.3	18.90	41.00
15.2	61.60	58.69	15.2	42.13	43.02	15.2	35.38	33.19	15.3	19.54	55.33	15.3	18.77	41.00
16.2	60.75	58.57	16.2	41.83	43.01	16.2	35.25	33.17	16.2	19.40	55.37	16.3	18.63	41.00
17.2	59.84	58.45	17.2	41.54	42.98	17.2	35.13	33.16	17.2	19.26	55.38	17.3	18.46	41.00
18.2	58.89	58.33	18.2	41.26	42.95	18.2	34.99	33.13	18.2	19.12	55.39	18.3	18.30	41.00
19.2	57.91	58.20	19.2	40.99	42.92	19.2	34.85	33.09	19.2	18.99	55.39	19.3	18.13	41.00
20.2	56.90	58.03	20.2	40.75	42.89	20.2	34.70	33.05	20.2	18.86	55.38	20.3	17.96	41.00
21.2	55.88	57.87	21.2	40.50	42.88	21.2	34.55	32.98	21.2	18.75	55.38	21.3	17.77	41.00
22.2	54.89	57.69	22.2	40.26	42.88	22.2	34.40	32.89	22.2	18.64	55.41	22.3	17.58	41.00
23.2	53.92	57.47	23.2	40.01	42.88	23.2	34.25	32.80	23.2	18.52	55.44	23.3	17.40	41.00
24.2	53.02	57.25	24.2	39.76	42.88	24.2	34.12	32.70	24.2	18.41	55.47	24.3	17.22	41.00
25.2	52.17	57.02	25.2	39.51	42.89	25.2	33.99	32.56	25.2	18.28	55.51	25.3	17.05	41.00
26.2	51.40	56.79	26.2	39.24	42.89	26.2	33.87	32.42	26.2	18.16	55.54	26.3	16.88	41.00
27.2	50.69	56.56	27.2	38.97	42.88	27.2	33.76	32.29	27.2	18.03	55.55	27.3	16.74	41.00
28.2	50.04	56.34	28.2	38.68	42.85	28.2	33.66	32.15	28.2	17.90	55.57	28.2	16.60	41.00
29.2	49.41	56.14	29.2	38.39	42.79	29.2	33.56	32.03	29.2	17.76	55.57	29.2	16.47	41.00
30.2	48.77	55.94	30.2	38.10	42.72	30.2	33.46	31.92	30.2	17.63	55.53	30.2	16.33	41.00
31.2	48.10	55.75	31.2	37.82	42.63	31.2	33.36	31.81	31.2	17.48	55.46	31.2	16.20	41.00
32.2	47.36	55.57	32.2	37.54	42.52	32.2	33.24	31.71	32.2	17.35	55.38	32.2	16.05	41.00
51.30	+51.29		12.32	-12.28		6.92	+6.85		6.11	-6.03		8.18	+8.1	
8 ^h 16 ^m 48 ^s .125			9 ^h 8 ^m 49 ^s .775			9 ^h 25 ^m 30 ^s .501			9 ^h 36 ^m 20 ^s .688			10 ^h 21 ^m 12 ^s .5		
+88° 52' 49".08			-85° 20' 12".12			+81° 41' 25".82			-80° 34' 23".04			+82° 58' 35".		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

77 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			2 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			K Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m	° '	May	h m	° '	May	h m	° '	May	h m	° '	May	h m	° '
	10 59	-84 9		12 14	+88 9		12 46	-84 41		12 48	+83 51		13 27	-85 22
	s	"		s	"		s	"		s	"		s	"
1.3	61.88	39.93	1.4	58.64	15.41	1.4	29.49	5.42	1.4	41.11	27.67	1.5	45.32	20.36
2.3	61.70	40.17	2.4	58.26	15.63	2.4	29.39	5.79	2.4	41.02	27.90	2.4	45.26	20.74
3.3	61.51	40.40	3.4	57.88	15.84	3.4	29.29	6.12	3.4	40.94	28.15	3.4	45.18	21.10
4.3	61.31	40.62	4.4	57.48	16.07	4.4	29.16	6.44	4.4	40.86	28.41	4.4	45.10	21.43
5.3	61.14	40.81	5.4	57.07	16.30	5.4	29.06	6.74	5.4	40.75	28.68	5.4	45.02	21.77
6.3	60.96	41.00	6.4	56.59	16.56	6.4	28.96	7.02	6.4	40.63	28.97	6.4	44.96	22.07
7.3	60.81	41.20	7.4	56.05	16.80	7.4	28.87	7.30	7.4	40.50	29.24	7.4	44.90	22.38
8.3	60.66	41.42	8.4	55.47	17.02	8.4	28.80	7.61	8.4	40.34	29.51	8.4	44.85	22.68
9.3	60.52	41.64	9.4	54.87	17.21	9.4	28.74	7.91	9.4	40.19	29.75	9.4	44.83	23.00
10.3	60.38	41.87	10.4	54.26	17.38	10.4	28.68	8.22	10.4	40.03	29.97	10.4	44.80	23.34
11.3	60.21	42.11	11.4	53.67	17.53	11.4	28.60	8.57	11.4	39.88	30.17	11.4	44.77	23.70
12.3	60.05	42.35	12.4	53.11	17.68	12.4	28.51	8.90	12.4	39.74	30.36	12.4	44.73	24.06
13.3	59.86	42.58	13.4	52.60	17.82	13.4	28.41	9.24	13.4	39.61	30.54	13.4	44.65	24.42
14.3	59.67	42.78	14.4	52.12	17.94	14.4	28.28	9.57	14.4	39.48	30.71	14.4	44.57	24.76
15.3	59.47	42.96	15.4	51.64	18.10	15.4	28.15	9.88	15.4	39.37	30.90	15.4	44.45	25.10
16.3	59.26	43.11	16.4	51.17	18.27	16.4	28.00	10.16	16.4	39.24	31.10	16.4	44.33	25.43
17.3	59.06	43.26	17.4	50.67	18.45	17.4	27.85	10.43	17.4	39.11	31.31	17.4	44.20	25.74
18.3	58.85	43.39	18.4	50.14	18.63	18.4	27.71	10.67	18.4	38.98	31.53	18.4	44.07	26.02
19.3	58.67	43.52	19.4	49.58	18.80	19.4	27.57	10.92	19.4	38.83	31.76	19.4	43.95	26.30
20.3	58.48	43.64	20.3	48.99	18.97	20.4	27.43	11.15	20.4	38.67	31.98	20.4	43.83	26.56
21.3	58.31	43.76	21.3	48.36	19.14	21.4	27.30	11.38	21.4	38.50	32.21	21.4	43.73	26.82
22.3	58.14	43.90	22.3	47.72	19.29	22.4	27.17	11.62	22.4	38.33	32.41	22.4	43.63	27.09
23.3	57.97	44.04	23.3	47.04	19.43	23.4	27.07	11.86	23.4	38.15	32.61	23.4	43.54	27.36
24.3	57.80	44.19	24.3	46.36	19.54	24.4	26.95	12.13	24.4	37.97	32.79	24.4	43.44	27.64
25.3	57.63	44.36	25.3	45.70	19.64	25.4	26.83	12.39	25.4	37.78	32.93	25.4	43.35	27.93
26.3	57.45	44.51	26.3	45.05	19.73	26.4	26.71	12.66	26.4	37.61	33.07	26.4	43.25	28.24
27.3	57.26	44.66	27.3	44.44	19.81	27.4	26.58	12.93	27.4	37.44	33.20	27.4	43.13	28.55
28.3	57.06	44.79	28.3	43.86	19.86	28.3	26.42	13.21	28.4	37.28	33.30	28.4	43.00	28.86
29.3	56.84	44.90	29.3	43.30	19.92	29.3	26.25	13.48	29.3	37.13	33.42	29.4	42.86	29.17
30.3	56.61	45.00	30.3	42.76	20.00	30.3	26.08	13.72	30.3	36.99	33.54	30.4	42.69	29.45
31.3	56.39	45.08	31.3	42.22	20.07	31.3	25.90	13.96	31.3	36.85	33.67	31.4	42.51	29.73
32.3	56.19	45.15	32.3	41.65	20.16	32.3	25.71	14.15	32.3	36.68	33.82	32.4	42.34	29.98
9.83	-9.78		31.06	+31.04		10.80	-10.75		9.35	+9.29		12.40	-12.36	
10 ^h 59 ^m	54° 19' 15"		12 ^h 14 ^m	28° 8' 04"		12 ^h 46 ^m	13° 13' 11"		12 ^h 48 ^m	30° 8' 62"		13 ^h 27 ^m	23° 7' 49"	
-84° 9'	9° 97'		+88° 9'	16° 14'		-84° 40'	41° 9' 55"		+83° 51'	30° 8' 88"		-85° 22'	0° 8' 86"	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	De- nat.
May	h m	° ' "	May	h m	° ' "	May	h m	° ' "	May	h m	° ' "	May	h m	° ' "
1.5	14 13	-83 17	1.5	15 3	+87 32	1.5	15 24	-84 11	1.6	16 54	+82 10	1.6	17 16	-84
2.5	54.48	52.35	2.5	38.79	46.94	2.5	31.73	48.57	2.6	23.34	13.60	2.6	20.03	1
3.5	54.49	52.74	3.5	38.79	47.21	3.5	31.82	48.94	3.6	23.41	13.86	3.6	20.16	2
4.5	54.49	53.11	4.5	38.83	47.48	4.5	31.90	49.31	4.6	23.49	14.11	4.6	20.28	2
5.5	54.47	53.47	5.5	38.84	47.80	5.5	31.95	49.66	5.6	23.57	14.37	5.6	20.38	2
6.5	54.46	53.80	6.5	38.85	48.12	6.5	32.00	49.98	6.6	23.65	14.67	6.6	20.47	3
7.5	54.45	54.11	7.5	38.83	48.45	7.5	32.06	50.28	7.6	23.72	14.98	7.6	20.56	3
8.5	54.44	54.42	8.5	38.78	48.81	8.5	32.14	50.57	8.6	23.78	15.32	8.6	20.65	3
9.5	54.45	54.73	9.5	38.69	49.17	9.5	32.21	50.86	9.6	23.84	15.68	9.6	20.76	3
10.5	54.48	55.04	10.5	38.55	49.50	10.5	32.29	51.16	10.6	23.88	16.03	10.6	20.88	3
11.5	54.51	55.36	11.5	38.38	49.84	11.5	32.38	51.47	11.6	23.92	16.39	11.6	21.00	4
12.5	54.52	55.72	12.5	38.21	50.16	12.5	32.48	51.80	12.6	23.96	16.72	12.6	21.12	4
13.5	54.53	56.08	13.5	38.06	50.44	13.5	32.57	52.15	13.6	23.99	17.02	13.6	21.26	4
14.4	54.54	56.45	14.4	37.92	50.71	14.4	32.65	52.51	14.6	24.02	17.31	14.6	21.38	4
15.4	54.51	56.82	15.4	37.80	50.98	15.4	32.70	52.89	15.6	24.05	17.59	15.6	21.49	5
16.4	54.48	57.19	16.4	37.69	51.26	16.4	32.75	53.26	16.6	24.09	17.86	16.6	21.59	5
17.4	54.44	57.54	17.4	37.60	51.53	17.4	32.77	53.61	17.6	24.13	18.14	17.6	21.69	5
18.4	54.40	57.86	18.4	37.50	51.84	18.4	32.78	53.94	18.6	24.18	18.45	18.6	21.76	5
19.4	54.34	58.17	19.4	37.39	52.14	19.4	32.79	54.27	19.6	24.22	18.77	19.6	21.83	6
20.4	54.29	58.45	20.4	37.26	52.46	20.4	32.81	54.59	20.6	24.26	19.10	20.6	21.89	6
21.4	54.25	58.73	21.4	37.10	52.79	21.4	32.81	54.88	21.6	24.30	19.46	21.6	21.95	6
22.4	54.21	59.02	22.4	36.93	53.12	22.4	32.82	55.17	22.6	24.32	19.82	22.6	22.03	6
23.4	54.17	59.31	23.4	36.72	53.45	23.4	32.85	55.44	23.6	24.34	20.18	23.6	22.10	7
24.4	54.14	59.59	24.4	36.49	53.77	24.4	32.87	55.73	24.6	24.35	20.54	24.6	22.18	7
25.4	54.12	59.88	25.4	36.24	54.09	25.4	32.91	56.04	25.6	24.36	20.90	25.6	22.27	7
26.4	54.10	60.18	26.4	35.97	54.38	26.4	32.95	56.35	26.6	24.36	21.26	26.6	22.36	7
27.4	54.07	60.49	27.4	35.69	54.65	27.4	32.99	56.68	27.6	24.35	21.60	27.6	22.45	8
28.4	54.04	60.81	28.4	35.41	54.90	28.4	33.02	57.02	28.6	24.35	21.92	28.6	22.54	8
29.4	54.00	61.14	29.4	35.17	55.14	29.4	33.03	57.38	29.6	24.34	22.23	29.6	22.63	8
30.4	53.92	61.48	30.4	34.93	55.37	30.4	33.03	57.74	30.6	24.34	22.51	30.6	22.71	9
31.4	53.85	61.80	31.4	34.70	55.60	31.4	33.01	58.09	31.6	24.33	22.79	31.6	22.78	9
32.4	53.77	62.10	32.4	34.48	55.84	32.4	32.98	58.43	32.6	24.34	23.08	32.6	22.83	9
33.4	53.68	62.38	33.4	34.27	56.11	33.4	32.94	58.75	33.6	24.34	23.40	33.6	22.87	10
8.57	-8.51		23.37	+23.35		9.89	-9.84		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m	37 ^s .066		15 ^h 3 ^m	21 ^s .809		15 ^h 24 ^m	9 ^s .966		16 ^h 54 ^m	19 ^s .238		17 ^h 16 ^m	6 ^s .0	
-83° 17'	37".78		+87° 32'	56".60		-84° 11'	42".92		+82° 10'	27".09		-80° 47'	10".4	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursa Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursa Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			η Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
May 17 58	+86 36		May 18 7	-87 39		May 19 1	+89 0		May 19 30	-89 12		May 20 48	+82 13	
1.6	44.36	37.41	1.6	32.19	35.97	1.7	17.11	54.40	1.7	50.98	57.20	1.8	34.10	32.50
2.6	44.58	37.61	2.6	32.75	36.19	2.7	18.03	54.54	2.7	52.88	57.28	2.8	34.24	32.54
3.6	44.81	37.82	3.6	33.27	36.41	3.7	19.00	54.68	3.7	54.68	57.37	3.8	34.39	32.55
4.6	45.07	38.04	4.6	33.75	36.63	4.7	20.03	54.82	4.7	56.39	57.46	4.7	34.56	32.58
5.6	45.32	38.26	5.6	34.21	36.84	5.7	21.10	54.99	5.7	57.99	57.55	5.7	34.74	32.61
6.6	45.57	38.53	6.6	34.63	37.02	6.7	22.21	55.18	6.7	59.53	57.63	6.7	34.88	32.66
7.6	45.81	38.81	7.6	35.06	37.17	7.7	23.30	55.40	7.7	61.04	57.69	7.7	35.06	32.75
8.6	46.04	39.13	8.6	35.53	37.32	8.7	24.35	55.63	8.7	62.59	57.74	8.7	35.24	32.86
9.6	46.23	39.44	9.6	36.03	37.49	9.7	25.30	55.90	9.7	64.20	57.79	9.7	35.41	32.99
10.6	46.41	39.75	10.6	36.53	37.65	10.7	26.16	56.14	10.7	65.91	57.83	10.7	35.57	33.13
11.6	46.56	40.05	11.6	37.08	37.82	11.7	26.94	56.39	11.7	67.71	57.88	11.7	35.73	33.26
12.6	46.71	40.34	12.6	37.63	38.02	12.7	27.68	56.63	12.7	69.54	57.97	12.7	35.88	33.40
13.6	46.85	40.61	13.6	38.15	38.23	13.6	28.38	56.86	13.7	71.39	58.07	13.7	36.02	33.52
14.6	47.00	40.88	14.6	38.65	38.47	14.6	29.10	57.07	14.7	73.21	58.20	14.7	36.17	33.63
15.6	47.17	41.12	15.6	39.12	38.74	15.6	29.86	57.27	15.7	74.93	58.34	15.7	36.30	33.74
16.6	47.33	41.38	16.6	39.54	39.00	16.6	30.67	57.46	16.7	76.55	58.49	16.7	36.44	33.84
17.6	47.51	41.64	17.6	39.93	39.24	17.6	31.51	57.66	17.7	78.07	58.64	17.7	36.58	33.95
18.6	47.69	41.91	18.6	40.31	39.49	18.6	32.39	57.89	18.7	79.53	58.79	18.7	36.73	34.08
19.6	47.88	42.20	19.6	40.66	39.73	19.6	33.28	58.13	19.7	80.92	58.93	19.7	36.90	34.20
20.6	48.05	42.51	20.6	41.00	39.96	20.6	34.17	58.39	20.7	82.27	59.07	20.7	37.06	34.35
21.6	48.21	42.83	21.6	41.34	40.16	21.6	35.03	58.66	21.6	83.61	59.20	21.7	37.22	34.51
22.6	48.36	43.16	22.6	41.70	40.37	22.6	35.84	58.94	22.6	84.96	59.33	22.7	37.38	34.68
23.6	48.49	43.50	23.6	42.07	40.58	23.6	36.60	59.24	23.6	86.36	59.44	23.7	37.54	34.87
24.6	48.59	43.85	24.6	42.45	40.78	24.6	37.28	59.55	24.6	87.80	59.55	24.7	37.69	35.09
25.6	48.68	44.19	25.6	42.87	41.01	25.6	37.90	59.86	25.6	89.32	59.68	25.7	37.84	35.31
26.6	48.75	44.51	26.6	43.29	41.25	26.6	38.42	60.16	26.6	90.90	59.80	26.7	37.98	35.51
27.6	48.81	44.82	27.6	43.72	41.51	27.6	38.89	60.45	27.6	92.50	59.95	27.7	38.11	35.72
28.6	48.86	45.12	28.6	44.13	41.77	28.6	39.35	60.73	28.6	94.10	60.12	28.7	38.23	35.92
29.6	48.92	45.41	29.6	44.51	42.06	29.6	39.80	60.98	29.6	95.69	60.31	29.7	38.36	36.12
30.6	49.00	45.68	30.6	44.86	42.36	30.6	40.30	61.22	30.6	97.17	60.53	30.7	38.47	36.30
31.6	49.08	45.96	31.6	45.17	42.66	31.6	40.84	61.47	31.6	98.54	60.76	31.7	38.60	36.47
32.6	49.16	46.26	32.6	45.45	42.96	32.6	41.43	61.73	32.6	99.79	60.97	32.7	38.73	36.65
16.92	+16.89		24.50	-24.48		58.23	+58.22		73.10	-73.09		7.39	+7.33	
17 ^h 58 ^m	41°.809		18 ^h 6 ^m	47°.620		19 ^h 1 ^m	27°.463		19 ^h 29 ^m	16°.746		20 ^h 48 ^m	36°.323	
+86° 36'	51''.12		-87° 39'	51''.38		+89° 1'	7''.53		-89° 13'	21''.02		+82° 13'	43''.34	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	De- nat.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	
May	21 38	-83 5	May	22 16	-86 22	May	22 37	-81 48	May	23 27	+86 51	May	23 47	-82
	s	"		s	"		s	"		s	"		s	
1.8	32.87	21.25	1.8	21.11	39.00	1.8	45.17	14.49	1.9	29.88	16.15	1.9	15.25	61
2.8	33.08	21.10	2.8	21.49	38.81	2.8	45.33	14.25	2.9	30.16	16.00	2.9	15.39	61
3.8	33.29	20.98	3.8	21.85	38.63	3.8	45.49	14.04	3.9	30.43	15.83	3.9	15.52	61
4.8	33.49	20.87	4.8	22.20	38.47	4.8	45.64	13.84	4.9	30.74	15.65	4.9	15.64	61
5.8	33.67	20.77	5.8	22.54	38.32	5.8	45.78	13.64	5.9	31.06	15.47	5.9	15.76	60
6.8	33.84	20.65	6.8	22.84	38.16	6.8	45.92	13.45	6.9	31.42	15.30	6.9	15.87	60
7.8	34.02	20.53	7.8	23.12	37.99	7.8	46.04	13.27	7.9	31.81	15.14	7.9	15.97	60
8.8	34.19	20.40	8.8	23.41	37.81	8.8	46.17	13.06	8.8	32.21	15.01	8.9	16.07	59
9.8	34.36	20.25	9.8	23.71	37.62	9.8	46.30	12.83	9.8	32.62	14.89	9.9	16.17	59
10.8	34.55	20.09	10.8	24.03	37.42	10.8	46.43	12.59	10.8	33.02	14.81	10.9	16.28	59
11.8	34.75	19.93	11.8	24.38	37.21	11.8	46.58	12.35	11.8	33.41	14.71	11.9	16.40	59
12.8	34.97	19.78	12.8	24.74	37.01	12.8	46.75	12.12	12.8	33.78	14.63	12.9	16.54	58
13.8	35.19	19.66	13.8	25.12	36.84	13.8	46.92	11.91	13.8	34.12	14.56	13.8	16.68	58
14.8	35.41	19.56	14.8	25.51	36.69	14.8	47.09	11.71	14.8	34.46	14.48	14.8	16.83	58
15.8	35.62	19.49	15.8	25.90	36.56	15.8	47.26	11.55	15.8	34.78	14.38	15.8	16.98	57
16.8	35.83	19.43	16.8	26.27	36.45	16.8	47.42	11.41	16.8	35.11	14.28	16.8	17.13	57
17.7	36.03	19.38	17.8	26.63	36.35	17.8	47.58	11.27	17.8	35.45	14.17	17.8	17.28	57
18.7	36.22	19.34	18.8	26.98	36.27	18.8	47.73	11.15	18.8	35.81	14.07	18.8	17.43	57
19.7	36.40	19.31	19.8	27.32	36.19	19.8	47.88	11.03	19.8	36.19	13.96	19.8	17.56	57
20.7	36.58	19.26	20.8	27.63	36.09	20.8	48.02	10.90	20.8	36.59	13.86	20.8	17.69	56
21.7	36.75	19.21	21.8	27.94	35.99	21.8	48.16	10.76	21.8	37.00	13.79	21.8	17.82	56
22.7	36.92	19.16	22.8	28.26	35.88	22.8	48.30	10.63	22.8	37.42	13.73	22.8	17.95	56
23.7	37.10	19.10	23.8	28.57	35.77	23.8	48.44	10.49	23.8	37.86	13.67	23.8	18.07	56
24.7	37.28	19.02	24.8	28.89	35.66	24.8	48.58	10.34	24.8	38.29	13.64	24.8	18.20	55
25.7	37.48	18.95	25.8	29.25	35.55	25.8	48.73	10.19	25.8	38.71	13.63	25.8	18.34	55
26.7	37.68	18.88	26.7	29.61	35.44	26.8	48.90	10.03	26.8	39.10	13.62	26.8	18.48	55
27.7	37.90	18.82	27.7	29.98	35.35	27.8	49.07	9.88	27.8	39.49	13.63	27.8	18.65	55
28.7	38.12	18.79	28.7	30.39	35.27	28.8	49.25	9.75	28.8	39.87	13.64	28.8	18.82	55
29.7	38.35	18.78	29.7	30.79	35.21	29.8	49.43	9.64	29.8	40.21	13.64	29.8	18.99	54
30.7	38.55	18.77	30.7	31.18	35.16	30.8	49.61	9.55	30.8	40.56	13.62	30.8	19.15	54
31.7	38.75	18.81	31.7	31.56	35.13	31.8	49.78	9.49	31.8	40.91	13.60	31.8	19.32	54
32.7	38.94	18.85	32.7	31.92	35.12	32.7	49.94	9.43	32.8	41.28	13.58	32.8	19.49	54
8.31	-8.25		15.82	-15.79		7.01	-6.94		18.22	+18.19		7.63	-7.56	
21 ^h 38 ^m 29 ^s .050			22 ^h 16 ^m 20 ^s .949			22 ^h 37 ^m 45 ^s .323			23 ^h 27 ^m 43 ^s .851			23 ^h 47 ^m 20 ^s .0		
-83° 5' 50".66			-86° 23' 9".03			-81° 48' 43".57			+86° 51' 18".76			-82° 28' 28".4		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

E. Cephei. Mag. 4.5		α Ursæ Minoris. (Polaris.) Mag. 2.1				4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.
h m	° '		h m	° '		h m	° '		h m	° '		h m	° '	
0 57	+85 49	June	1 30	+88 51	June	1 41	-85 10	June	4 10	+85 20	June	5 35	+85 9	
s	"		s	"		s	"		s	"		s	"	
13.86	1.54	0.9	23.51	59.89	0.9	43.71	36.11	0.9	17.38	21.80	1.0	29.93	36.55	
14.12	1.41	1.9	24.32	59.70	1.9	43.89	35.84	1.9	17.44	21.51	2.0	29.90	36.26	
14.39	1.28	2.9	25.20	59.51	2.9	44.04	35.58	2.9	17.51	21.22	3.0	29.88	35.95	
14.66	1.14	3.9	26.17	59.32	3.9	44.18	35.33	3.9	17.59	20.89	4.0	29.86	35.61	
14.98	1.00	4.9	27.23	59.15	4.9	44.31	35.09	4.9	17.70	20.57	5.0	29.85	35.27	
15.30	0.90	5.9	28.35	58.99	5.9	44.44	34.84	5.9	17.84	20.25	6.0	29.89	34.93	
15.64	0.82	6.9	29.51	58.85	6.9	44.58	34.57	6.9	18.00	19.95	7.0	29.94	34.58	
15.98	0.78	7.9	30.65	58.73	7.9	44.71	34.28	7.9	18.17	19.66	8.0	30.01	34.24	
16.30	0.74	8.8	31.74	58.63	8.9	44.87	33.97	8.9	18.33	19.39	9.0	30.09	33.93	
16.60	0.71	9.8	32.77	58.55	9.9	45.04	33.67	9.9	18.49	19.14	10.0	30.16	33.65	
16.88	0.68	10.8	33.74	58.47	10.9	45.22	33.38	10.9	18.64	18.90	11.0	30.22	33.37	
17.15	0.64	11.8	34.66	58.39	11.8	45.42	33.11	11.9	18.78	18.68	12.0	30.27	33.11	
17.41	0.59	12.8	35.56	58.30	12.8	45.63	32.85	12.9	18.90	18.45	13.0	30.31	32.84	
17.68	0.53	13.8	36.48	58.18	13.8	45.84	32.61	13.9	19.01	18.21	14.0	30.35	32.57	
17.95	0.46	14.8	37.42	58.06	14.8	46.05	32.39	14.9	19.13	17.94	15.0	30.38	32.26	
18.23	0.40	15.8	38.41	57.94	15.8	46.25	32.19	15.9	19.26	17.67	15.9	30.40	31.96	
18.53	0.32	16.8	39.45	57.83	16.8	46.44	32.00	16.9	19.39	17.40	16.9	30.44	31.65	
18.85	0.26	17.8	40.55	57.72	17.8	46.62	31.80	17.9	19.54	17.11	17.9	30.49	31.33	
19.17	0.22	18.8	41.69	57.61	18.8	46.81	31.61	18.9	19.71	16.83	18.9	30.55	30.99	
19.51	0.19	19.8	42.85	57.51	19.8	46.99	31.43	19.9	19.88	16.54	19.9	30.63	30.65	
19.85	0.18	20.8	44.06	57.44	20.8	47.16	31.24	20.9	20.08	16.26	20.9	30.72	30.32	
20.19	0.18	21.8	45.27	57.38	21.8	47.35	31.02	21.9	20.29	16.00	21.9	30.84	29.99	
20.53	0.21	22.8	46.46	57.35	22.8	47.54	30.79	22.9	20.51	15.77	22.9	30.97	29.68	
20.85	0.25	23.8	47.62	57.34	23.8	47.74	30.56	23.9	20.73	15.55	23.9	31.11	29.39	
21.15	0.31	24.8	48.72	57.34	24.8	47.96	30.33	24.9	20.94	15.35	24.9	31.24	29.13	
21.44	0.36	25.8	49.76	57.34	25.8	48.18	30.12	25.9	21.14	15.16	25.9	31.37	28.88	
21.72	0.40	26.8	50.76	57.34	26.8	48.43	29.91	26.9	21.34	14.98	26.9	31.48	28.63	
22.00	0.43	27.8	51.75	57.32	27.8	48.67	29.72	27.9	21.53	14.79	27.9	31.59	28.37	
22.29	0.44	28.8	52.75	57.29	28.8	48.92	29.57	28.9	21.69	14.58	28.9	31.69	28.10	
22.57	0.45	29.8	53.79	57.26	29.8	49.15	29.42	29.9	21.86	14.36	29.9	31.77	27.82	
22.88	0.46	30.8	54.90	57.21	30.8	49.38	29.29	30.9	22.05	14.12	30.9	31.86	27.51	
23.21	0.49	31.8	56.10	57.17	31.8	49.59	29.17	31.9	22.26	13.87	31.9	31.98	27.20	
+13.67		50.53	+50.52		11.89	-11.85		12.30	+12.26		11.85	+11.81		
57 ^m 16 ^s .959		1 ^h 30 ^m 42 ^s .307		1 ^h 41 ^m 58 ^s .587		4 ^h 10 ^m 20 ^s .187		5 ^h 35 ^m 31 ^s .554						
49' 4'''.72		+88° 52' 2'''.06		-85° 11' 3'''.34		+85° 20' 19'''.62		+85° 9' 32'''.39						

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			C Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Ootantis Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	De- clination.
June	h m	° ' "	June	h m	° ' "	June	h m	° ' "	June	h m	° ' "	June	h m	° ' "
	5 45	-84 49		6 46	-80 43		7 2	+87 10		7 13	+82 34		7 15	-86 11
1.0	39.82	51.28	1.1	42.75	56.84	1.1	31.51	55.07	1.1	55.98	29.30	1.1	25.42	31
2.0	39.73	50.97	2.1	42.67	56.56	2.1	31.29	54.81	2.1	55.90	29.07	2.1	25.14	31
3.0	39.64	50.69	3.1	42.60	56.31	3.1	31.07	54.51	3.1	55.82	28.79	3.1	24.88	31
4.0	39.56	50.43	4.1	42.53	56.07	4.1	30.87	54.20	4.1	55.73	28.51	4.1	24.62	31
5.0	39.47	50.18	5.1	42.46	55.83	5.1	30.69	53.88	5.1	55.66	28.20	5.1	24.36	30
6.0	39.38	49.92	6.1	42.38	55.62	6.1	30.55	53.55	6.1	55.61	27.89	6.1	24.09	30
7.0	39.28	49.64	7.1	42.30	55.40	7.1	30.44	53.20	7.1	55.56	27.56	7.1	23.79	30
8.0	39.16	49.35	8.1	42.22	55.17	8.1	30.38	52.86	8.1	55.54	27.24	8.1	23.48	30
9.0	39.05	49.04	9.1	42.14	54.91	9.1	30.32	52.54	9.1	55.53	26.93	9.1	23.17	30
10.0	38.95	48.72	10.1	42.06	54.63	10.1	30.28	52.25	10.1	55.52	26.64	10.1	22.87	29
11.0	38.86	48.36	11.1	41.98	54.31	11.1	30.23	51.97	11.1	55.49	26.38	11.1	22.58	29
12.0	38.79	48.02	12.1	41.92	53.99	12.1	30.16	51.69	12.1	55.46	26.12	12.1	22.30	29
13.0	38.73	47.67	13.1	41.86	53.67	13.1	30.08	51.42	13.1	55.44	25.87	13.1	22.05	29
14.0	38.69	47.33	14.1	41.81	53.35	14.1	29.97	51.15	14.1	55.40	25.61	14.1	21.82	28
15.0	38.66	47.00	15.0	41.75	53.04	15.1	29.87	50.87	15.1	55.35	25.34	15.1	21.61	28
16.0	38.62	46.69	16.0	41.70	52.74	16.1	29.76	50.56	16.1	55.30	25.05	16.1	21.42	28
17.0	38.59	46.41	17.0	41.65	52.45	17.1	29.64	50.24	17.1	55.25	24.74	17.1	21.24	27
18.0	38.57	46.12	18.0	41.61	52.18	18.1	29.54	49.92	18.1	55.21	24.43	18.1	21.06	27
18.9	38.54	45.82	19.0	41.57	51.92	19.0	29.46	49.56	19.1	55.17	24.12	19.1	20.88	27
19.9	38.51	45.53	20.0	41.52	51.66	20.0	29.41	49.21	20.1	55.16	23.79	20.1	20.70	27
20.9	38.48	45.24	21.0	41.49	51.40	21.0	29.40	48.85	21.1	55.15	23.46	21.1	20.51	26
21.9	38.44	44.95	22.0	41.44	51.13	22.0	29.40	48.52	22.0	55.15	23.12	22.1	20.30	26
22.9	38.40	44.64	23.0	41.40	50.85	23.0	29.44	48.18	23.0	55.16	22.79	23.0	20.08	26
23.9	38.36	44.33	24.0	41.35	50.54	24.0	29.49	47.85	24.0	55.19	22.47	24.0	19.86	26
24.9	38.32	43.99	25.0	41.30	50.22	25.0	29.55	47.54	25.0	55.21	22.17	25.0	19.65	25
25.9	38.30	43.65	26.0	41.26	49.89	26.0	29.62	47.25	26.0	55.23	21.89	26.0	19.45	25
26.9	38.29	43.29	27.0	41.22	49.55	27.0	29.67	46.96	27.0	55.25	21.62	27.0	19.26	25
27.9	38.30	42.92	28.0	41.19	49.19	28.0	29.69	46.68	28.0	55.26	21.35	28.0	19.12	24
28.9	38.32	42.58	29.0	41.17	48.85	29.0	29.70	46.40	29.0	55.25	21.08	29.0	18.98	24
29.9	38.35	42.25	30.0	41.16	48.53	30.0	29.69	46.09	30.0	55.24	20.77	30.0	18.89	24
30.9	38.38	41.94	31.0	41.15	48.22	31.0	29.67	45.76	31.0	55.23	20.45	31.0	18.80	24
31.9	38.41	41.66	32.0	41.13	47.94	32.0	29.68	45.39	32.0	55.23	20.09	32.0	18.71	23
11.10	-11.05		6.21	-6.13		20.33	+20.31		7.74	+7.67		18.54	-18.51	
5 ^h 46 ^m	3°.075		6 ^h 46 ^m	53°.600		7 ^h 2 ^m	33°.206		7 ^h 13 ^m	55°.106		7 ^h 16 ^m	0°.0	
-84° 49'	45'' 59		-80° 43'	42'' 15		+87° 10'	49'' 32		+82° 34'	23'' 73		-86° 54'	13'' 11	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Cambridge 1119. Mag. 7.0			Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
June 8 16	h m	° ' "	June 9 8	h m	° ' "	June 9 25	h m	° ' "	June 9 36	h m	° ' "	June 10 21	h m	° ' "
1.2	47.36	55.57	1.2	37.54	42.52	1.2	33.24	31.71	1.2	17.35	55.38	1.2	16.05	41.41
2.1	46.56	55.37	2.2	37.30	42.42	2.2	33.11	31.61	2.2	17.22	55.30	2.2	15.88	41.38
3.1	45.72	55.14	3.2	37.06	42.32	3.2	32.97	31.48	3.2	17.11	55.24	3.2	15.70	41.33
4.1	44.87	54.91	4.2	36.84	42.25	4.2	32.83	31.31	4.2	17.00	55.18	4.2	15.53	41.25
5.1	44.06	54.63	5.2	36.62	42.19	5.2	32.70	31.15	5.2	16.90	55.14	5.2	15.35	41.16
6.1	43.33	54.32	6.2	36.40	42.14	6.2	32.59	30.97	6.2	16.80	55.11	6.2	15.17	41.03
7.1	42.67	54.01	7.2	36.16	42.09	7.2	32.48	30.73	7.2	16.69	55.09	7.2	15.02	40.90
8.1	42.12	53.72	8.2	35.91	42.03	8.2	32.37	30.51	8.2	16.56	55.06	8.2	14.87	40.75
9.1	41.64	53.44	9.2	35.65	41.95	9.2	32.28	30.31	9.2	16.44	55.02	9.2	14.73	40.59
0.1	41.19	53.16	10.2	35.39	41.86	10.2	32.19	30.12	10.2	16.31	54.96	10.2	14.61	40.45
1.1	40.75	52.90	11.2	35.12	41.73	11.2	32.11	29.93	11.2	16.18	54.87	11.2	14.49	40.32
2.1	40.28	52.66	12.2	34.85	41.59	12.2	32.03	29.74	12.2	16.04	54.77	12.2	14.37	40.20
3.1	39.76	52.43	13.2	34.60	41.44	13.2	31.94	29.58	13.2	15.92	54.63	13.2	14.24	40.09
4.1	39.20	52.19	14.2	34.36	41.27	14.2	31.85	29.42	14.2	15.79	54.49	14.2	14.10	39.98
5.1	38.60	51.93	15.1	34.13	41.10	15.2	31.74	29.26	15.2	15.69	54.35	15.2	13.94	39.87
6.1	37.98	51.67	16.1	33.94	40.93	16.2	31.62	29.08	16.2	15.58	54.21	16.2	13.79	39.75
7.1	37.36	51.39	17.1	33.73	40.77	17.2	31.51	28.89	17.2	15.48	54.07	17.2	13.62	39.62
8.1	36.74	51.11	18.1	33.53	40.63	18.2	31.40	28.68	18.2	15.38	53.94	18.2	13.47	39.48
9.1	36.17	50.80	19.1	33.34	40.49	19.2	31.29	28.46	19.2	15.28	53.82	19.2	13.32	39.31
0.1	35.65	50.47	20.1	33.14	40.36	20.1	31.19	28.20	20.2	15.18	53.70	20.2	13.16	39.13
1.1	35.18	50.13	21.1	32.95	40.22	21.1	31.09	27.94	21.2	15.09	53.60	21.2	13.01	38.94
2.1	34.90	49.79	22.1	32.75	40.09	22.1	31.01	27.68	22.1	14.99	53.48	22.2	12.88	38.72
3.1	34.50	49.45	23.1	32.53	39.95	23.1	30.93	27.41	23.1	14.89	53.35	23.2	12.75	38.49
4.1	34.26	49.14	24.1	32.31	39.82	24.1	30.88	27.15	24.1	14.78	53.22	24.2	12.64	38.27
5.1	34.06	48.82	25.1	32.07	39.64	25.1	30.82	26.89	25.1	14.67	53.09	25.2	12.54	38.07
6.1	33.87	48.53	26.1	31.84	39.44	26.1	30.77	26.65	26.1	14.55	52.92	26.2	12.44	37.87
7.1	33.65	48.26	27.1	31.61	39.22	27.1	30.71	26.42	27.1	14.44	52.74	27.2	12.35	37.68
3.1	33.37	47.98	28.1	31.41	38.99	28.1	30.64	26.21	28.1	14.33	52.54	28.2	12.22	37.50
1.1	33.03	47.71	29.1	31.22	38.75	29.1	30.55	25.99	29.1	14.22	52.33	29.2	12.10	37.33
1.1	32.65	47.40	30.1	31.05	38.52	30.1	30.47	25.75	30.1	14.12	52.13	30.2	11.98	37.14
1.1	32.25	47.09	31.1	30.88	38.30	31.1	30.39	25.49	31.1	14.04	51.94	31.2	11.84	36.95
2.1	31.87	46.76	32.1	30.74	38.10	32.1	30.29	25.22	32.1	13.96	51.75	32.2	11.69	36.73
12.1	+51.20		12.32	-12.28		6.92	+6.85		6.11	-6.03		8.18	+8.12	
8 ^h 16 ^m	48°.125		9 ^h 8 ^m	49°.775		9 ^h 25 ^m	30°.501		9 ^h 36 ^m	20°.688		10 ^h 21 ^m	12°.394	
18° 52'	49°'.08		-85° 20'	12°'.12		+81° 41'	25°'.82		-80° 34'	23°'.04		+82° 58'	35°'.87	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ε Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	s		h m	s		h m	s		h m	s		h m	s
June	10 59	-84 9	June	12 14	+88 9	June	12 46	-84 41	June	12 48	+83 51	June	13 27	-85 22
	s	"		s	"		s	"		s	"		s	"
1.3	56.19	45.15	1.3	41.65	20.16	1.3	25.71	14.15	1.3	36.68	33.82	1.4	42.34	29.98
2.3	55.99	45.21	2.3	41.03	20.26	2.3	25.52	14.33	2.3	36.52	33.97	2.4	42.16	30.21
3.3	55.80	45.26	3.3	40.37	20.36	3.3	25.37	14.51	3.3	36.33	34.12	3.4	42.01	30.43
4.3	55.62	45.31	4.3	39.67	20.46	4.3	25.22	14.68	4.3	36.14	34.27	4.4	41.86	30.64
5.3	55.45	45.39	5.3	38.93	20.52	5.3	25.07	14.85	5.3	35.92	34.41	5.4	41.73	30.86
6.2	55.28	45.47	6.3	38.18	20.56	6.3	24.94	15.05	6.3	35.71	34.50	6.4	41.61	31.09
7.2	55.11	45.57	7.3	37.46	20.57	7.3	24.80	15.27	7.3	35.51	34.57	7.4	41.49	31.33
8.2	54.93	45.67	8.3	36.76	20.57	8.3	24.66	15.49	8.3	35.32	34.62	8.3	41.37	31.00
9.2	54.73	45.74	9.3	36.12	20.56	9.3	24.49	15.71	9.3	35.13	34.66	9.3	41.21	31.87
10.2	54.52	45.80	10.3	35.51	20.54	10.3	24.32	15.93	10.3	34.96	34.70	10.3	41.03	32.14
11.2	54.30	45.85	11.3	34.92	20.53	11.3	24.13	16.13	11.3	34.79	34.74	11.3	40.84	32.39
12.2	54.08	45.89	12.3	34.36	20.54	12.3	23.91	16.32	12.3	34.62	34.80	12.3	40.64	32.62
13.2	53.86	45.89	13.3	33.77	20.57	13.3	23.71	16.47	13.3	34.45	34.87	13.3	40.42	32.82
14.2	53.64	45.87	14.3	33.16	20.58	14.3	23.51	16.61	14.3	34.28	34.95	14.3	40.21	33.01
15.2	53.45	45.84	15.3	32.53	20.60	15.3	23.30	16.73	15.3	34.10	35.02	15.3	39.99	33.19
16.2	53.25	45.81	16.3	31.87	20.63	16.3	23.10	16.83	16.3	33.91	35.10	16.3	39.80	33.33
17.2	53.07	45.78	17.3	31.18	20.66	17.3	22.91	16.92	17.3	33.71	35.16	17.3	39.60	33.48
18.2	52.88	45.75	18.3	30.45	20.66	18.3	22.74	17.03	18.3	33.51	35.22	18.3	39.41	33.62
19.2	52.71	45.75	19.3	29.72	20.65	19.3	22.57	17.15	19.3	33.29	35.29	19.3	39.24	33.78
20.2	52.53	45.73	20.3	28.99	20.61	20.3	22.40	17.28	20.3	33.08	35.33	20.3	39.05	33.95
21.2	52.36	45.73	21.3	28.27	20.56	21.3	22.23	17.41	21.3	32.86	35.34	21.3	38.88	34.12
22.2	52.19	45.73	22.3	27.56	20.49	22.3	22.05	17.53	22.3	32.66	35.35	22.3	38.71	34.30
23.2	51.99	45.74	23.3	26.89	20.41	23.3	21.88	17.67	23.3	32.46	35.32	23.3	38.54	34.49
24.2	51.80	45.74	24.3	26.24	20.31	24.3	21.69	17.81	24.3	32.27	35.28	24.3	38.35	34.68
25.2	51.59	45.71	25.2	25.64	20.21	25.3	21.48	17.95	25.3	32.10	35.23	25.3	38.15	34.87
26.2	51.37	45.66	26.2	25.07	20.11	26.3	21.26	18.06	26.3	31.92	35.19	26.3	37.91	35.04
27.2	51.15	45.59	27.2	24.50	20.04	27.3	21.03	18.16	27.3	31.76	35.17	27.3	37.66	35.18
28.2	50.95	45.51	28.2	23.92	19.98	28.3	20.80	18.22	28.3	31.58	35.16	28.3	37.41	35.32
29.2	50.75	45.42	29.2	23.32	19.93	29.3	20.57	18.27	29.3	31.40	35.17	29.3	37.16	35.42
30.2	50.56	45.32	30.2	22.67	19.87	30.3	20.37	18.32	30.3	31.21	35.17	30.3	36.92	35.52
31.2	50.38	45.22	31.2	21.97	19.83	31.3	20.17	18.35	31.3	31.00	35.17	31.3	36.70	35.60
32.2	50.23	45.14	32.2	21.23	19.75	32.3	19.99	18.39	32.3	30.77	35.14	32.3	36.51	35.69
9.83	-9.78		31.07	+31.06		10.80	-10.76		9.35	+9.30		12.40	-12.36	
10 ^h 59 ^m	54 ^s .915		12 ^h 14 ^m	28 ^s .804		12 ^h 46 ^m	13 ^s .131		12 ^h 48 ^m	30 ^s .862		13 ^h 27 ^m	23 ^s .749	
-84° 9'	9'' .97		+88° 9'	16'' .14		-84° 40'	41'' .95		+83° 51'	30'' .88		-85° 22'	0'' .86	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

♌ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			♍ Octantis. Mag. 5.7			♎ Ursæ Minoris. Mag. 4.4			♏ G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
June	14 13	-83 18	June	15 3	+87 32	June	15 24	-84 11	June	16 54	+82 10	June	17 16	-80 47
	s	"		s	"		s	"		s	"		s	"
1.4	53.68	2.38	1.4	34.27	56.11	1.4	32.94	58.75	1.5	24.34	23.40	1.5	22.87	10.02
2.4	53.59	2.65	2.4	34.04	56.38	2.4	32.90	59.04	2.5	24.33	23.73	2.5	22.91	10.31
3.4	53.50	2.89	3.4	33.77	56.68	3.4	32.86	59.33	3.5	24.33	24.09	3.5	22.95	10.57
4.4	53.44	3.14	4.4	33.46	56.98	4.4	32.83	59.60	4.5	24.32	24.45	4.5	23.00	10.81
5.4	53.38	3.38	5.4	33.10	57.27	5.4	32.83	59.86	5.5	24.29	24.81	5.5	23.04	11.05
6.4	53.33	3.63	6.4	32.73	57.55	6.4	32.83	60.13	6.5	24.26	25.18	6.5	23.10	11.28
7.4	53.28	3.90	7.4	32.35	57.79	7.4	32.83	60.43	7.5	24.21	25.54	7.5	23.18	11.54
8.4	53.23	4.19	8.4	31.95	58.02	8.4	32.83	60.74	8.5	24.17	25.88	8.5	23.26	11.82
9.4	53.16	4.48	9.4	31.58	58.21	9.4	32.82	61.07	9.5	24.13	26.19	9.5	23.32	12.12
10.4	53.08	4.78	10.4	31.24	58.41	10.4	32.79	61.41	10.5	24.08	26.48	10.5	23.38	12.43
11.4	52.98	5.07	11.4	30.90	58.60	11.4	32.75	61.73	11.5	24.04	26.76	11.5	23.43	12.76
12.4	52.88	5.35	12.4	30.59	58.80	12.4	32.67	62.06	12.5	24.01	27.04	12.5	23.47	13.10
13.4	52.75	5.61	13.4	30.28	59.02	13.4	32.60	62.37	13.5	23.97	27.33	13.5	23.48	13.41
14.4	52.64	5.84	14.4	29.97	59.24	14.4	32.52	62.66	14.5	23.94	27.64	14.5	23.49	13.72
15.4	52.52	6.06	15.4	29.64	59.47	15.4	32.43	62.93	15.5	23.90	27.95	15.5	23.50	14.00
16.4	52.40	6.25	16.4	29.28	59.71	16.4	32.35	63.16	16.5	23.86	28.27	16.5	23.51	14.28
17.4	52.30	6.43	17.4	28.91	59.94	17.4	32.27	63.41	17.5	23.81	28.61	17.5	23.52	14.54
18.4	52.20	6.62	18.4	28.51	60.19	18.4	32.19	63.65	18.5	23.77	28.96	18.5	23.53	14.78
19.3	52.09	6.82	19.4	28.10	60.42	19.4	32.13	63.89	19.5	23.71	29.30	19.5	23.54	15.03
20.3	52.00	7.04	20.4	27.65	60.65	20.4	32.07	64.13	20.5	23.63	29.65	20.5	23.57	15.28
21.3	51.91	7.25	21.4	27.20	60.84	21.4	32.01	64.40	21.5	23.55	29.99	21.5	23.59	15.55
22.3	51.82	7.47	22.4	26.73	61.03	22.4	31.96	64.66	22.5	23.48	30.30	22.5	23.63	15.82
23.3	51.73	7.68	23.4	26.27	61.18	23.4	31.90	64.93	23.5	23.40	30.58	23.5	23.67	16.11
24.3	51.62	7.91	24.4	25.81	61.33	24.4	31.83	65.22	24.4	23.33	30.86	24.5	23.70	16.41
25.3	51.50	8.14	25.4	25.39	61.46	25.4	31.75	65.52	25.4	23.24	31.12	25.5	23.71	16.73
26.3	51.37	8.37	26.4	24.97	61.59	26.4	31.66	65.81	26.4	23.17	31.36	26.5	23.72	17.05
27.3	51.23	8.57	27.4	24.58	61.73	27.4	31.53	66.10	27.4	23.10	31.62	27.5	23.71	17.38
28.3	51.07	8.76	28.4	24.18	61.88	28.4	31.40	66.35	28.4	23.03	31.88	28.5	23.70	17.70
29.3	50.93	8.90	29.4	23.79	62.04	29.4	31.27	66.58	29.4	22.95	32.16	29.4	23.67	17.98
30.3	50.78	9.05	30.4	23.38	62.22	30.4	31.15	66.78	30.4	22.88	32.46	30.4	23.64	18.25
31.3	50.64	9.17	31.4	22.92	62.39	31.4	31.03	66.98	31.4	22.80	32.77	31.4	23.63	18.48
32.3	50.52	9.29	32.3	22.42	62.57	32.4	30.93	67.17	32.4	22.71	33.10	32.4	23.62	18.71
8.57	-8.51		23.39	+23.37		9.90	-9.85		7.34	+7.28		6.25	-6.17	
14 ^h 13 ^m	37°.066		15 ^h 3 ^m	21°.809		15 ^h 24 ^m	9°.966		16 ^h 54 ^m	19°.238		17 ^h 16 ^m	6°.064	
-83° 17'	37'''.78		+87° 32'	56'''.60		-84° 11'	42'''.92		+82° 10'	27'''.09		-80° 47'	10'''.43	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursa Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursa Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
June	17 58	+86 36	June	18 7	-87 39	June	19 1	+89 1	June	19 31	-89 13	June	20 48	+82 13
	s	"		s	"		s	"		s	"		s	"
1.6	49.16	46.26	1.6	45.45	42.96	1.6	41.43	1.73	1.6	39.79	0.97	1.7	38.73	36.65
2.6	49.25	46.58	2.6	45.68	43.24	2.6	42.05	2.01	2.6	40.96	1.17	2.7	38.86	36.84
3.5	49.34	46.92	3.6	45.93	43.48	3.6	42.68	2.32	3.6	42.06	1.35	3.7	38.99	37.07
4.5	49.41	47.28	4.6	46.18	43.72	4.6	43.26	2.64	4.6	43.16	1.53	4.7	39.14	37.30
5.5	49.46	47.65	5.6	46.45	43.95	5.6	43.75	2.97	5.6	44.32	1.70	5.7	39.29	37.57
6.5	49.47	48.02	6.5	46.75	44.17	6.6	44.15	3.32	6.6	45.56	1.86	6.7	39.42	37.85
7.5	49.46	48.37	7.5	47.07	44.42	7.6	44.46	3.68	7.6	46.88	2.02	7.7	39.55	38.14
8.5	49.43	48.71	8.5	47.40	44.68	8.6	44.69	4.01	8.6	48.27	2.20	8.7	39.66	38.44
9.5	49.40	49.05	9.5	47.74	44.95	9.6	44.87	4.33	9.6	49.67	2.40	9.7	39.77	38.71
10.5	49.37	49.35	10.5	48.05	45.26	10.6	45.06	4.62	10.6	51.03	2.62	10.6	39.87	38.97
11.5	49.36	49.64	11.5	48.33	45.59	11.6	45.27	4.91	11.6	52.32	2.86	11.6	39.96	39.22
12.5	49.35	49.93	12.5	48.55	45.91	12.6	45.52	5.18	12.6	53.51	3.12	12.6	40.07	39.46
13.5	49.35	50.23	13.5	48.74	46.23	13.6	45.81	5.46	13.6	54.60	3.38	13.6	40.17	39.66
14.5	49.36	50.54	14.5	48.90	46.55	14.6	46.14	5.76	14.6	55.58	3.64	14.6	40.27	39.92
15.5	49.36	50.86	15.5	49.04	46.84	15.6	46.48	6.07	15.6	56.48	3.88	15.6	40.38	40.18
16.5	49.37	51.18	16.5	49.16	47.13	16.6	46.83	6.38	16.6	57.33	4.13	16.6	40.49	40.44
17.5	49.36	51.53	17.5	49.28	47.40	17.6	47.13	6.72	17.6	58.15	4.36	17.6	40.61	40.71
18.5	49.33	51.89	18.5	49.41	47.66	18.6	47.42	7.05	18.6	58.96	4.58	18.6	40.72	41.00
19.5	49.30	52.25	19.5	49.55	47.92	19.5	47.63	7.42	19.6	59.80	4.82	19.6	40.84	41.31
20.5	49.24	52.62	20.5	49.70	48.17	20.5	47.78	7.78	20.6	60.68	5.04	20.6	40.94	41.63
21.5	49.16	52.98	21.5	49.87	48.44	21.5	47.85	8.14	21.6	61.61	5.26	21.6	41.04	41.95
22.5	49.06	53.31	22.5	50.05	48.71	22.5	47.83	8.50	22.6	62.61	5.48	22.6	41.13	42.26
23.5	48.95	53.65	23.5	50.24	49.00	23.5	47.75	8.84	23.6	63.63	5.71	23.6	41.21	42.62
24.5	48.82	53.96	24.5	50.42	49.32	24.5	47.63	9.16	24.6	64.66	5.98	24.6	41.29	42.94
25.5	48.71	54.25	25.5	50.59	49.65	25.5	47.50	9.48	25.6	65.67	6.24	25.6	41.35	43.26
26.5	48.60	54.53	26.5	50.73	49.99	26.5	47.40	9.77	26.5	66.60	6.52	26.6	41.41	43.54
27.5	48.50	54.81	27.5	50.81	50.32	27.5	47.34	10.07	27.5	67.42	6.83	27.6	41.49	43.82
28.5	48.40	55.09	28.5	50.85	50.66	28.5	47.32	10.36	28.5	68.12	7.13	28.6	41.56	44.10
29.5	48.31	55.40	29.5	50.85	50.98	29.5	47.35	10.68	29.5	68.71	7.42	29.6	41.63	44.40
30.5	48.23	55.73	30.5	50.84	51.27	30.5	47.39	11.01	30.5	69.19	7.70	30.6	41.73	44.71
31.5	48.13	56.08	31.5	50.84	51.55	31.5	47.40	11.37	31.5	69.66	7.98	31.6	41.79	45.04
32.5	48.01	56.44	32.5	50.87	51.81	32.5	47.35	11.75	32.5	70.16	8.22	32.6	41.88	45.40
16.93	+16.90		24.52	-24.50		58.37	+58.36		73.24	-73.24		7.40	+7.33	
17 ^h 58 ^m 41 ^s .809			18 ^h 6 ^m 47 ^s .620			19 ^h 1 ^m 27 ^s .463			19 ^h 29 ^m 16 ^s .746			20 ^h 48 ^m 36 ^s .323		
+86° 36' 51".12			-87° 39' 51".38			+89° 1' 7".53			-89° 13' 21".02			+82° 13' 43".34		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
June	h m 21 38	° ' " -83 5	June	h m 22 16	° ' " -86 22	June	h m 22 37	° ' " -81 48	June	h m 23 27	° ' " +86 51	June	h m 23 47	° ' " -82 27
1.7	38.94	18.85	1.7	31.92	35.12	1.7	49.94	9.43	1.8	41.28	13.58	1.8	19.49	54.30
2.7	39.13	18.88	2.7	32.26	35.10	2.7	50.09	9.37	2.8	41.67	13.56	2.8	19.64	54.16
3.7	39.29	18.89	3.7	32.59	35.07	3.7	50.24	9.32	3.8	42.09	13.54	3.8	19.78	54.01
4.7	39.45	18.90	4.7	32.89	35.04	4.7	50.38	9.25	4.8	42.54	13.55	4.8	19.92	53.86
5.7	39.62	18.91	5.7	33.19	35.00	5.7	50.52	9.16	5.8	42.99	13.58	5.8	20.05	53.70
6.7	39.80	18.90	6.7	33.51	34.95	6.7	50.66	9.07	6.8	43.45	13.63	6.8	20.19	53.53
7.7	39.98	18.88	7.7	33.86	34.90	7.7	50.82	8.97	7.8	43.88	13.71	7.8	20.34	53.35
8.7	40.18	18.87	8.7	34.22	34.84	8.7	50.99	8.88	8.8	44.28	13.81	8.8	20.50	53.15
9.7	40.39	18.88	9.7	34.60	34.80	9.7	51.17	8.80	9.8	44.66	13.91	9.8	20.68	52.97
10.7	40.61	18.91	10.7	34.99	34.79	10.7	51.35	8.74	10.8	45.03	13.99	10.8	20.87	52.81
11.7	40.82	18.97	11.7	35.39	34.78	11.7	51.53	8.69	11.8	45.38	14.06	11.8	21.06	52.67
12.7	41.01	19.05	12.7	35.77	34.80	12.7	51.71	8.68	12.8	45.72	14.12	12.8	21.24	52.56
13.7	41.20	19.14	13.7	36.14	34.84	13.7	51.87	8.69	13.7	46.09	14.17	13.8	21.41	52.46
14.7	41.38	19.24	14.7	36.48	34.90	14.7	52.03	8.71	14.7	46.45	14.22	14.8	21.58	52.38
15.7	41.55	19.34	15.7	36.80	34.97	15.7	52.18	8.73	15.7	46.85	14.27	15.8	21.74	52.30
16.7	41.70	19.43	16.7	37.11	35.04	16.7	52.32	8.75	16.7	47.25	14.33	16.8	21.90	52.24
17.7	41.85	19.53	17.7	37.41	35.09	17.7	52.46	8.76	17.7	47.66	14.40	17.8	22.04	52.18
18.7	42.01	19.61	18.7	37.71	35.14	18.7	52.61	8.78	18.7	48.08	14.48	18.8	22.19	52.11
19.7	42.16	19.69	19.7	38.01	35.18	19.7	52.74	8.79	19.7	48.51	14.58	19.7	22.33	52.04
20.7	42.32	19.76	20.7	38.31	35.22	20.7	52.88	8.79	20.7	48.94	14.70	20.7	22.49	51.96
21.7	42.48	19.83	21.7	38.62	35.25	21.7	53.03	8.78	21.7	49.36	14.83	21.7	22.65	51.87
22.7	42.65	19.91	22.7	38.95	35.28	22.7	53.18	8.77	22.7	49.76	14.98	22.7	22.81	51.77
23.6	42.83	20.00	23.7	39.31	35.33	23.7	53.35	8.77	23.7	50.14	15.15	23.7	22.99	51.68
24.6	43.03	20.09	24.7	39.67	35.38	24.7	53.52	8.79	24.7	50.50	15.33	24.7	23.16	51.60
25.6	43.22	20.21	25.7	40.03	35.46	25.7	53.69	8.82	25.7	50.84	15.49	25.7	23.35	51.53
26.6	43.41	20.34	26.7	40.40	35.55	26.7	53.87	8.86	26.7	51.16	15.64	26.7	23.54	51.47
27.6	43.59	20.49	27.7	40.75	35.66	27.7	54.04	8.94	27.7	51.48	15.78	27.7	23.73	51.44
28.6	43.74	20.66	28.7	41.09	35.79	28.7	54.19	9.03	28.7	51.81	15.91	28.7	23.91	51.43
29.6	43.88	20.83	29.7	41.38	35.93	29.7	54.33	9.13	29.7	52.17	16.03	29.7	24.08	51.44
30.6	44.03	20.99	30.7	41.67	36.05	30.7	54.46	9.23	30.7	52.55	16.17	30.7	24.23	51.45
31.6	44.15	21.14	31.7	41.92	36.16	31.7	54.59	9.32	31.7	52.95	16.33	31.7	24.37	51.46
32.6	44.27	21.28	32.6	42.17	36.27	32.7	54.71	9.39	32.7	53.37	16.51	32.7	24.51	51.46
8.31	-8.25		15.82	-15.79		7.01	-6.94		18.22	+18.19		7.63	-7.56	
21 ^h 38 ^m	29 ^s .060		22 ^h 16 ^m	20 ^s .949		22 ^h 37 ^m	45 ^s .323		23 ^h 27 ^m	43 ^s .851		23 ^h 47 ^m	20 ^s .032	
-83° 5'	50''.66		-86° 23'	9''.03		-81° 48'	43''.57		+86° 51'	18''.76		-82° 28'	28''.42	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
July	h m s	° ' "	July	h m s	° ' "	July	h m s	° ' "	July	h m s	° ' "	July	h m s	° ' "
0 57	0 57	+85 49	1 30	1 30	+88 51	1 41	1 41	-85 10	4 10	4 10	+85 20	5 35	5 35	+85 9
0.8	22.88	0.46	0.8	54.90	57.21	0.8	49.38	29.29	0.9	22.05	14.12	0.9	31.86	27.51
1.8	23.21	0.49	1.8	56.10	57.17	1.8	49.59	29.17	1.9	22.26	13.87	1.9	31.98	27.20
2.8	23.56	0.53	2.8	57.37	57.15	2.8	49.78	29.04	2.9	22.49	13.61	2.9	32.11	26.88
3.8	23.91	0.58	3.8	58.67	57.14	3.8	49.97	28.93	3.9	22.75	13.37	3.9	32.28	26.56
4.8	24.26	0.68	4.8	59.97	57.17	4.8	50.17	28.78	4.9	23.02	13.16	4.9	32.45	26.25
5.8	24.61	0.79	5.8	61.22	57.21	5.8	50.38	28.62	5.9	23.29	12.97	5.9	32.64	25.96
6.8	24.93	0.91	6.8	62.42	57.27	6.8	50.61	28.46	6.9	23.56	12.83	6.9	32.84	25.69
7.7	25.25	1.04	7.8	63.54	57.35	7.8	50.85	28.30	7.9	23.82	12.69	7.9	33.03	25.45
8.7	25.53	1.15	8.8	64.60	57.41	8.8	51.11	28.14	8.9	24.06	12.55	8.9	33.20	25.22
9.7	25.81	1.25	9.8	65.63	57.47	9.8	51.37	28.02	9.9	24.29	12.41	9.9	33.36	25.00
10.7	26.08	1.35	10.8	66.65	57.53	10.8	51.64	27.92	10.9	24.50	12.26	10.9	33.51	24.78
11.7	26.36	1.43	11.8	67.67	57.57	11.8	51.89	27.84	11.9	24.71	12.09	11.9	33.65	24.53
12.7	26.64	1.52	12.8	68.73	57.58	12.8	52.14	27.78	12.9	24.93	11.92	12.9	33.79	24.27
13.7	26.95	1.60	13.8	69.84	57.61	13.8	52.39	27.72	13.9	25.16	11.73	13.9	33.94	24.01
14.7	27.26	1.68	14.8	71.00	57.65	14.8	52.64	27.67	14.9	25.38	11.55	14.9	34.10	23.74
15.7	27.58	1.78	15.7	72.19	57.68	15.8	52.86	27.64	15.9	25.63	11.37	15.9	34.27	23.46
16.7	27.90	1.89	16.7	73.41	57.73	16.8	53.08	27.60	16.9	25.90	11.19	16.9	34.44	23.19
17.7	28.23	2.03	17.7	74.66	57.81	17.8	53.30	27.54	17.9	26.18	11.02	17.9	34.64	22.90
18.7	28.56	2.19	18.7	75.92	57.90	18.7	53.52	27.49	18.9	26.46	10.86	18.9	34.86	22.63
19.7	28.89	2.37	19.7	77.15	58.02	19.7	53.74	27.42	19.8	26.76	10.74	19.9	35.09	22.39
20.7	29.20	2.54	20.7	78.35	58.15	20.7	53.97	27.34	20.8	27.07	10.63	20.9	35.33	22.16
21.7	29.50	2.72	21.7	79.50	58.28	21.7	54.22	27.25	21.8	27.37	10.53	21.9	35.57	21.95
22.7	29.79	2.92	22.7	80.59	58.43	22.7	54.49	27.18	22.8	27.66	10.43	22.9	35.80	21.75
23.7	30.07	3.13	23.7	81.63	58.57	23.7	54.76	27.12	23.8	27.94	10.35	23.9	36.02	21.58
24.7	30.31	3.31	24.7	82.62	58.71	24.7	55.03	27.08	24.8	28.20	10.28	24.9	36.24	21.40
25.7	30.56	3.48	25.7	83.60	58.82	25.7	55.31	27.06	25.8	28.45	10.21	25.9	36.44	21.21
26.7	30.83	3.63	26.7	84.61	58.93	26.7	55.57	27.07	26.8	28.70	10.10	26.9	36.63	20.99
27.7	31.11	3.78	27.7	85.68	59.03	27.7	55.82	27.10	27.8	28.96	9.98	27.9	36.82	20.77
28.7	31.39	3.94	28.7	86.83	59.13	28.7	56.05	27.13	28.8	29.23	9.85	28.9	37.03	20.54
29.7	31.71	4.11	29.7	88.04	59.25	29.7	56.27	27.16	29.8	29.53	9.71	29.9	37.25	20.29
30.7	32.04	4.30	30.7	89.29	59.38	30.7	56.48	27.19	30.8	29.84	9.59	30.9	37.50	20.05
31.7	32.36	4.52	31.7	90.55	59.55	31.7	56.69	27.20	31.8	30.16	9.48	31.9	37.77	19.82
13.71	+13.67		50.53	+50.52		11.89	-11.84		12.30	+12.26		11.84	+11.80	
0 ^h 57 ^m 16 ^s .959			1 ^h 30 ^m 42 ^s .307			1 ^h 41 ^m 58 ^s .587			4 ^h 10 ^m 20 ^s .187			5 ^h 35 ^m 31 ^s .554		
+85° 49' 4".72			+88° 52' 2".06			-85° 11' 3".34			+85° 20' 19".62			+85° 9' 32".39		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensae. Mag. 6.2			ζ Mensae. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.
uly	h m 5 45	° ' -84 49	July	h m 6 46	° ' -80 43	July	h m 7 2	° ' +87 10	July	h m 7 13	° ' +82 34	July	h m 7 15	° ' -86 54
	s "	"		s "	"		s "	"		s "	"		s "	"
0.9	38.38	41.94	1.0	41.15	48.22	1.0	29.67	45.76	1.0	55.23	20.45	1.0	18.80	24.02
1.9	38.41	41.66	2.0	41.13	47.94	2.0	29.68	45.39	2.0	55.23	20.09	2.0	18.71	23.77
2.9	38.44	41.38	3.0	41.12	47.66	3.0	29.72	45.02	3.0	55.25	19.73	3.0	18.62	23.53
3.9	38.45	41.11	3.9	41.11	47.38	4.0	29.80	44.65	4.0	55.28	19.38	4.0	18.50	23.29
4.9	38.45	40.82	4.9	41.10	47.12	5.0	29.93	44.28	5.0	55.33	19.02	5.0	18.38	23.02
5.9	38.46	40.51	5.9	41.08	46.83	6.0	30.07	43.93	6.0	55.38	18.67	6.0	18.24	22.75
6.9	38.48	40.20	6.9	41.06	46.51	7.0	30.25	43.61	7.0	55.44	18.36	7.0	18.11	22.47
7.9	38.50	39.86	7.9	41.04	46.17	7.9	30.40	43.30	8.0	55.50	18.07	8.0	17.98	22.15
8.9	38.53	39.52	8.9	41.03	45.84	8.9	30.55	43.02	9.0	55.56	17.78	9.0	17.87	21.82
9.9	38.58	39.19	9.9	41.02	45.47	9.9	30.68	42.73	10.0	55.61	17.51	10.0	17.78	21.47
10.9	38.65	38.84	10.9	41.02	45.11	10.9	30.79	42.45	10.9	55.65	17.24	11.0	17.73	21.12
11.9	38.73	38.52	11.9	41.03	44.77	11.9	30.89	42.15	11.9	55.69	16.97	11.9	17.69	20.78
12.9	38.81	38.20	12.9	41.04	44.43	12.9	30.98	41.84	12.9	55.72	16.66	12.9	17.68	20.46
13.9	38.89	37.91	13.9	41.07	44.11	13.9	31.08	41.52	13.9	55.75	16.35	13.9	17.68	20.16
14.9	38.98	37.63	14.9	41.09	43.79	14.9	31.17	41.19	14.9	55.78	16.04	14.9	17.68	19.86
15.9	39.06	37.36	15.9	41.11	43.51	15.9	31.29	40.85	15.9	55.82	15.71	15.9	17.69	19.58
16.9	39.15	37.09	16.9	41.13	43.22	16.9	31.43	40.50	16.9	55.86	15.38	16.9	17.70	19.31
17.9	39.23	36.83	17.9	41.16	42.95	17.9	31.60	40.14	17.9	55.91	15.02	17.9	17.71	19.03
18.9	39.30	36.58	18.9	41.17	42.68	18.9	31.79	39.81	18.9	56.00	14.68	18.9	17.70	18.76
19.9	39.38	36.30	19.9	41.18	42.38	19.9	32.02	39.46	19.9	56.09	14.35	19.9	17.67	18.49
20.9	39.45	36.02	20.9	41.19	42.07	20.9	32.28	39.13	20.9	56.18	14.03	20.9	17.64	18.21
21.9	39.53	35.72	21.9	41.22	41.76	21.9	32.54	38.81	21.9	56.27	13.72	21.9	17.61	17.89
22.9	39.61	35.41	22.9	41.24	41.43	22.9	32.81	38.54	22.9	56.37	13.43	22.9	17.60	17.57
23.9	39.70	35.09	23.9	41.26	41.07	23.9	33.06	38.27	23.9	56.47	13.17	23.9	17.59	17.22
24.9	39.82	34.77	24.9	41.29	40.73	24.9	33.29	38.00	24.9	56.56	12.91	24.9	17.62	16.88
25.9	39.94	34.48	25.9	41.33	40.40	25.9	33.51	37.74	25.9	56.64	12.65	25.9	17.66	16.53
26.9	40.07	34.20	26.9	41.38	40.07	26.9	33.70	37.45	26.9	56.71	12.37	26.9	17.75	16.20
27.9	40.22	33.95	27.9	41.43	39.76	27.9	33.88	37.14	27.9	56.78	12.07	27.9	17.85	15.91
28.9	40.35	33.71	28.9	41.48	39.48	28.9	34.07	36.83	28.9	56.85	11.75	28.9	17.95	15.62
29.9	40.49	33.48	29.9	41.53	39.22	29.9	34.29	36.50	29.9	56.92	11.42	29.9	18.05	15.36
29.9	40.62	33.25	30.9	41.58	38.96	30.9	34.55	36.15	30.9	57.01	11.07	30.9	18.14	15.10
29.9	40.73	33.06	31.9	41.63	38.70	31.9	34.85	35.81	31.9	57.13	10.73	31.9	18.22	14.85
1.09	-11.05		6.21	-6.13		20.31	+20.29		7.73	+7.67		18.52	-18.50	
5 ^h 46 ^m	3°.075		6 ^h 46 ^m	53°.600		7 ^h 2 ^m	33°.206		7 ^h 13 ^m	55°.106		7 ^h 16 ^m	0°.004	
4° 49'	45''.59		-80° 43'	42''.15		+87° 10'	49''.32		+82° 34'	23''.73		-86° 54'	13''.24	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
July	h m	° ' "	July	h m	° ' "	July	h m	° ' "	July	h m	° ' "	July	h m	° ' "
	8 16	+88 52		9 8	-85 20		9 25	+81 41		9 36	-80 34		10 21	+82 56
	s	" "		s	" "		s	" "		s	" "		s	" "
1.1	32.25	47.09	1.1	30.88	38.30	1.1	30.39	25.49	1.1	14.04	51.94	1.2	11.84	36.95
2.1	31.87	46.76	2.1	30.74	38.10	2.1	30.29	25.22	2.1	13.96	51.75	2.2	11.69	36.73
3.1	31.56	46.39	3.1	30.60	37.92	3.1	30.21	24.94	3.1	13.89	51.58	3.2	11.56	36.47
4.1	31.34	46.02	4.1	30.43	37.74	4.1	30.14	24.61	4.1	13.81	51.42	4.1	11.43	36.19
5.1	31.21	45.64	5.1	30.27	37.57	5.1	30.09	24.28	5.1	13.73	51.26	5.1	11.33	35.92
6.1	31.16	45.27	6.1	30.09	37.38	6.1	30.05	23.95	6.1	13.64	51.10	6.1	11.23	35.64
7.1	31.17	44.94	7.1	29.91	37.17	7.1	30.01	23.65	7.1	13.55	50.92	7.1	11.15	35.36
8.0	31.20	44.61	8.1	29.72	36.94	8.1	29.98	23.36	8.1	13.46	50.72	8.1	11.07	35.09
9.0	31.22	44.29	9.1	29.54	36.68	9.1	29.95	23.08	9.1	13.36	50.49	9.1	10.99	34.85
10.0	31.20	44.00	10.1	29.36	36.42	10.1	29.92	22.81	10.1	13.27	50.25	10.1	10.92	34.61
11.0	31.14	43.70	11.1	29.22	36.14	11.1	29.88	22.55	11.1	13.18	49.98	11.1	10.83	34.37
12.0	31.04	43.39	12.1	29.06	35.87	12.1	29.83	22.29	12.1	13.09	49.71	12.1	10.73	34.14
13.0	30.91	43.08	13.1	28.93	35.59	13.1	29.77	22.02	13.1	13.03	49.44	13.1	10.63	33.90
14.0	30.76	42.75	14.1	28.82	35.31	14.1	29.71	21.74	14.1	12.97	49.19	14.1	10.52	33.66
15.0	30.63	42.41	15.1	28.71	35.05	15.1	29.66	21.45	15.1	12.91	48.94	15.1	10.41	33.39
16.0	30.53	42.06	16.1	28.61	34.81	16.1	29.60	21.13	16.1	12.85	48.70	16.1	10.30	33.13
17.0	30.47	41.70	17.1	28.52	34.57	17.1	29.55	20.81	17.1	12.79	48.45	17.1	10.19	32.85
18.0	30.47	41.32	18.1	28.42	34.34	18.1	29.50	20.48	18.1	12.73	48.23	18.1	10.10	32.55
19.0	30.53	40.94	19.1	28.31	34.10	19.1	29.46	20.14	19.1	12.67	48.00	19.1	10.01	32.23
20.0	30.70	40.57	20.1	28.20	33.86	20.1	29.46	19.78	20.1	12.61	47.77	20.1	9.94	31.91
21.0	30.93	40.20	21.0	28.07	33.61	21.1	29.44	19.43	21.1	12.55	47.54	21.1	9.88	31.59
22.0	31.21	39.85	22.0	27.94	33.35	22.1	29.44	19.09	22.1	12.47	47.30	22.1	9.83	31.27
23.0	31.51	39.52	23.0	27.81	33.08	23.1	29.45	18.77	23.1	12.40	47.03	23.1	9.79	30.95
24.0	31.81	39.21	24.0	27.68	32.77	24.1	29.45	18.47	24.1	12.34	46.77	24.1	9.75	30.65
25.0	32.06	38.90	25.0	27.58	32.45	25.1	29.44	18.18	25.1	12.28	46.46	25.1	9.70	30.38
26.0	32.25	38.58	26.0	27.48	32.13	26.0	29.44	17.89	26.1	12.22	46.15	26.1	9.65	30.10
26.9	32.38	38.26	27.0	27.40	31.81	27.0	29.41	17.60	27.1	12.17	45.86	27.1	9.57	29.82
27.9	32.49	37.94	28.0	27.35	31.52	28.0	29.38	17.28	28.0	12.12	45.56	28.1	9.49	29.54
28.9	32.61	37.58	29.0	27.31	31.23	29.0	29.35	16.95	29.0	12.08	45.27	29.1	9.42	29.22
29.9	32.77	37.21	30.0	27.27	30.96	30.0	29.34	16.59	30.0	12.07	44.98	30.1	9.34	28.89
30.9	33.01	36.82	31.0	27.24	30.70	31.0	29.32	16.20	31.0	12.04	44.73	31.1	9.28	28.52
31.9	33.32	36.42	32.0	27.19	30.45	32.0	29.32	15.82	32.0	12.01	44.49	32.1	9.22	28.15
51.09	+51.08		12.32	-12.28		6.92	+6.85		6.11	-6.03		8.18	+8.12	
8 ^h 16 ^m 48 ^s .125			9 ^h 8 ^m 49 ^s .775			9 ^h 25 ^m 30 ^s .501			9 ^h 36 ^m 20 ^s .688			10 ^h 21 ^m 12 ^s .394		
+88° 52' 49".08			-85° 20' 12".12			+81° 41' 25".82			-80° 34' 23".04			+82° 58' 35".87		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

77 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
sh. m. m.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
ly	h m 10 59	° ' " -84 9	July	h m 12 14	° ' " +88 9	July	h m 12 46	° ' " -84 41	July	h m 12 48	° ' " +83 51	July	h m 13 27	° ' " -85 22
1.2	s 50.38	" 45.22	1.2	s 21.97	" 19.83	1.3	s 20.17	" 18.35	1.3	s 31.00	" 35.17	1.3	s 36.70	" 35.60
2.2	s 50.23	" 45.14	2.2	s 21.23	" 19.75	2.3	s 19.99	" 18.39	2.3	s 30.77	" 35.14	2.3	s 36.51	" 35.69
3.2	s 50.08	" 45.06	3.2	s 20.50	" 19.63	3.2	s 19.81	" 18.44	3.3	s 30.55	" 35.10	3.3	s 36.32	" 35.78
4.2	s 49.91	" 45.00	4.2	s 19.76	" 19.50	4.2	s 19.65	" 18.50	4.2	s 30.34	" 35.04	4.3	s 36.14	" 35.88
5.2	s 49.74	" 44.95	5.2	s 19.07	" 19.35	5.2	s 19.47	" 18.57	5.2	s 30.12	" 34.95	5.3	s 35.96	" 36.00
6.2	s 49.57	" 44.89	6.2	s 18.43	" 19.17	6.2	s 19.29	" 18.65	6.2	s 29.93	" 34.85	6.3	s 35.76	" 36.13
7.2	s 49.38	" 44.81	7.2	s 17.82	" 19.00	7.2	s 19.09	" 18.71	7.2	s 29.74	" 34.74	7.3	s 35.54	" 36.26
8.2	s 49.19	" 44.72	8.2	s 17.25	" 18.84	8.2	s 18.87	" 18.77	8.2	s 29.57	" 34.62	8.3	s 35.30	" 36.36
9.2	s 49.00	" 44.59	9.2	s 16.70	" 18.69	9.2	s 18.63	" 18.81	9.2	s 29.40	" 34.51	9.3	s 35.04	" 36.47
10.2	s 48.80	" 44.46	10.2	s 16.17	" 18.54	10.2	s 18.40	" 18.82	10.2	s 29.23	" 34.42	10.3	s 34.78	" 36.55
1.2	s 48.61	" 44.32	11.2	s 15.62	" 18.41	11.2	s 18.16	" 18.82	11.2	s 29.06	" 34.34	11.3	s 34.51	" 36.60
2.2	s 48.42	" 44.15	12.2	s 15.03	" 18.29	12.2	s 17.94	" 18.80	12.2	s 28.88	" 34.26	12.3	s 34.25	" 36.64
3.1	s 48.25	" 43.97	13.2	s 14.43	" 18.16	13.2	s 17.71	" 18.75	13.2	s 28.69	" 34.19	13.3	s 34.00	" 36.66
4.1	s 48.08	" 43.79	14.2	s 13.80	" 18.04	14.2	s 17.52	" 18.70	14.2	s 28.50	" 34.13	14.2	s 33.76	" 36.67
5.1	s 47.94	" 43.61	15.2	s 13.15	" 17.90	15.2	s 17.31	" 18.66	15.2	s 28.30	" 34.07	15.2	s 33.52	" 36.67
6.1	s 47.79	" 43.46	16.2	s 12.49	" 17.73	16.2	s 17.12	" 18.60	16.2	s 28.08	" 33.96	16.2	s 33.30	" 36.66
7.1	s 47.65	" 43.30	17.2	s 11.83	" 17.57	17.2	s 16.94	" 18.56	17.2	s 27.87	" 33.85	17.2	s 33.08	" 36.66
8.1	s 47.51	" 43.15	18.2	s 11.16	" 17.40	18.2	s 16.75	" 18.53	18.2	s 27.67	" 33.72	18.2	s 32.89	" 36.69
9.1	s 47.38	" 43.00	19.2	s 10.51	" 17.18	19.2	s 16.58	" 18.50	19.2	s 27.47	" 33.59	19.2	s 32.67	" 36.71
10.1	s 47.23	" 42.86	20.2	s 9.91	" 16.95	20.2	s 16.40	" 18.49	20.2	s 27.28	" 33.41	20.2	s 32.46	" 36.76
11.1	s 47.08	" 42.71	21.2	s 9.35	" 16.72	21.2	s 16.20	" 18.48	21.2	s 27.10	" 33.23	21.2	s 32.24	" 36.80
2.1	s 46.91	" 42.55	22.2	s 8.82	" 16.48	22.2	s 15.99	" 18.47	22.2	s 26.93	" 33.04	22.2	s 32.00	" 36.84
3.1	s 46.74	" 42.37	23.2	s 8.33	" 16.25	23.2	s 15.77	" 18.44	23.2	s 26.77	" 32.84	23.2	s 31.75	" 36.87
4.1	s 46.57	" 42.19	24.2	s 7.86	" 16.02	24.2	s 15.54	" 18.40	24.2	s 26.61	" 32.66	24.2	s 31.48	" 36.87
5.1	s 46.40	" 41.97	25.2	s 7.38	" 15.80	25.2	s 15.31	" 18.32	25.2	s 26.45	" 32.52	25.2	s 31.21	" 36.87
6.1	s 46.25	" 41.74	26.2	s 6.89	" 15.61	26.2	s 15.09	" 18.24	26.2	s 26.29	" 32.36	26.2	s 30.93	" 36.84
7.1	s 46.10	" 41.50	27.2	s 6.35	" 15.42	27.2	s 14.87	" 18.11	27.2	s 26.12	" 32.21	27.2	s 30.69	" 36.79
8.1	s 45.97	" 41.27	28.2	s 5.79	" 15.23	28.2	s 14.67	" 17.98	28.2	s 25.93	" 32.06	28.2	s 30.44	" 36.71
9.1	s 45.85	" 41.04	29.2	s 5.19	" 15.02	29.2	s 14.49	" 17.85	29.2	s 25.74	" 31.91	29.2	s 30.21	" 36.63
10.1	s 45.75	" 40.82	30.2	s 4.57	" 14.80	30.2	s 14.31	" 17.75	30.2	s 25.54	" 31.75	30.2	s 30.02	" 36.57
1.1	s 45.65	" 40.63	31.2	s 3.95	" 14.54	31.2	s 14.17	" 17.65	31.2	s 25.34	" 31.56	31.2	s 29.82	" 36.51
2.1	s 45.54	" 40.44	32.1	s 3.38	" 14.26	32.2	s 14.01	" 17.56	32.2	s 25.15	" 31.33	32.2	s 29.63	" 36.46
9.83	-9.78		31.06	+31.04		10.80	-10.76		9.35	+9.30		12.41	-12.37	
0 ^h 59 ^m	54°.915		12 ^h 14 ^m	28°.804		12 ^h 46 ^m	13°.131		12 ^h 48 ^m	30°.862		13 ^h 27 ^m	23°.749	
4° 9'	9''.97		+88° 9'	16''.14		-84° 40'	41''.95		+83° 51'	30''.88		-85° 22'	0''.86	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2383. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
July	h m	° '	July	h m	° '	July	h m	° '	July	h m	° '	July	h m	° '
	14 13	-83 18		15 3	+87 33		15 24	-84 12		16 54	+82 10		17 16	-80 47
	s	"		s	"		s	"		s	"		s	"
1.3	50.64	9.17	1.4	22.92	2.39	1.4	31.03	6.98	1.4	22.80	32.77	1.4	23.63	18.48
2.3	50.52	9.29	2.3	22.42	2.57	2.4	30.93	7.17	2.4	22.71	33.10	2.4	23.62	18.71
3.3	50.41	9.42	3.3	21.89	2.75	3.4	30.84	7.36	3.4	22.60	33.42	3.4	23.61	18.94
4.3	50.31	9.57	4.3	21.34	2.89	4.4	30.76	7.58	4.4	22.50	33.72	4.4	23.62	19.18
5.3	50.20	9.74	5.3	20.80	3.00	5.4	30.67	7.80	5.4	22.38	33.99	5.4	23.62	19.46
6.3	50.07	9.91	6.3	20.28	3.10	6.4	30.58	8.04	6.4	22.27	34.23	6.4	23.62	19.73
7.3	49.95	10.09	7.3	19.77	3.18	7.3	30.47	8.29	7.4	22.16	34.46	7.4	23.62	20.01
8.3	49.82	10.26	8.3	19.28	3.25	8.3	30.35	8.53	8.4	22.05	34.69	8.4	23.61	20.33
9.3	49.65	10.42	9.3	18.82	3.32	9.3	30.21	8.76	9.4	21.94	34.91	9.4	23.58	20.63
10.3	49.48	10.56	10.3	18.37	3.40	10.3	30.06	8.99	10.4	21.84	35.13	10.4	23.54	20.92
11.3	49.32	10.65	11.3	17.92	3.48	11.3	29.89	9.18	11.4	21.74	35.35	11.4	23.50	21.20
12.3	49.14	10.74	12.3	17.46	3.57	12.3	29.73	9.36	12.4	21.64	35.59	12.4	23.45	21.47
13.3	48.97	10.82	13.3	16.99	3.68	13.3	29.56	9.51	13.4	21.53	35.84	13.4	23.40	21.72
14.3	48.82	10.88	14.3	16.50	3.79	14.3	29.40	9.65	14.4	21.42	36.11	14.4	23.34	21.96
15.3	48.67	10.94	15.3	15.99	3.91	15.3	29.25	9.79	15.4	21.30	36.37	15.4	23.28	22.17
16.3	48.52	10.99	16.3	15.45	4.02	16.3	29.11	9.94	16.4	21.18	36.62	16.4	23.23	22.39
17.3	48.38	11.04	17.3	14.90	4.11	17.3	28.97	10.06	17.4	21.06	36.87	17.4	23.19	22.60
18.3	48.25	11.11	18.3	14.34	4.18	18.3	28.83	10.20	18.4	20.92	37.12	18.4	23.15	22.82
19.3	48.11	11.19	19.3	13.76	4.23	19.3	28.71	10.34	19.4	20.79	37.36	19.4	23.11	23.06
20.3	47.98	11.27	20.3	13.19	4.27	20.3	28.58	10.51	20.4	20.65	37.58	20.4	23.08	23.28
21.3	47.83	11.37	21.3	12.62	4.29	21.3	28.44	10.69	21.4	20.50	37.77	21.4	23.04	23.54
22.3	47.69	11.47	22.3	12.09	4.29	22.3	28.29	10.88	22.4	20.36	37.95	22.4	23.00	23.80
23.3	47.52	11.56	23.3	11.57	4.28	23.3	28.13	11.06	23.4	20.22	38.10	23.4	22.95	24.07
24.3	47.34	11.62	24.3	11.07	4.28	24.3	27.96	11.24	24.4	20.09	38.25	24.4	22.91	24.34
25.3	47.16	11.68	25.3	10.59	4.28	25.3	27.77	11.39	25.4	19.96	38.41	25.4	22.83	24.60
26.2	46.99	11.69	26.3	10.10	4.31	26.3	27.58	11.50	26.4	19.83	38.60	26.4	22.75	24.83
27.2	46.81	11.70	27.3	9.60	4.34	27.3	27.39	11.60	27.4	19.70	38.80	27.4	22.66	25.06
28.2	46.64	11.69	28.3	9.07	4.39	28.3	27.20	11.68	28.4	19.57	39.01	28.4	22.57	25.24
29.2	46.48	11.67	29.3	8.52	4.43	29.3	27.03	11.74	29.4	19.42	39.23	29.4	22.49	25.42
30.2	46.33	11.66	30.3	7.92	4.46	30.3	26.87	11.80	30.3	19.27	39.44	30.4	22.43	25.59
31.2	46.20	11.65	31.3	7.31	4.47	31.3	26.72	11.88	31.3	19.12	39.64	31.4	22.37	25.75
32.2	46.07	11.65	32.3	6.70	4.45	32.3	26.58	11.96	32.3	18.95	39.83	32.4	22.31	25.92
8.58	-8.52		23.40	+23.38		9.90	-9.85		7.35	+7.28		6.25	-6.17	
14 ^h 13 ^m	37 ^s .066		15 ^h 3 ^m	21 ^s .809		15 ^h 24 ^m	9 ^s .966		16 ^h 54 ^m	19 ^s .238		17 ^h 16 ^m	6 ^s .064	
-83° 17'	37''.78		+87° 32'	56''.60		-84° 11'	42''.92		+82° 10'	27''.09		-80° 47'	10''.43	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			γ Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
July	h m	° ' "	July	h m	° ' "	July	h m	° ' "	July	h m	° ' "	July	h m	° ' "
17 58	+86 36	"	18 7	-87 39	"	19 1	+89 1	"	19 32	-89 13	"	20 48	+82 13	"
1.5	48.13	56.08	1.5	50.84	51.55	1.5	47.40	11.37	1.5	9.66	7.98	1.6	41.79	45.04
2.5	48.01	56.44	2.5	50.87	51.81	2.5	47.35	11.75	2.5	10.16	8.22	2.6	41.88	45.40
3.5	47.87	56.80	3.5	50.90	52.06	3.5	47.21	12.12	3.5	10.70	8.45	3.6	41.95	45.78
4.5	47.69	57.16	4.5	50.97	52.32	4.5	46.96	12.50	4.5	11.34	8.69	4.6	42.03	46.15
5.5	47.51	57.49	5.5	51.06	52.58	5.5	46.64	12.87	5.5	12.03	8.94	5.6	42.08	46.53
6.5	47.31	57.81	6.5	51.14	52.89	6.5	46.25	13.21	6.5	12.77	9.21	6.6	42.14	46.92
7.5	47.11	58.10	7.5	51.19	53.20	7.5	45.84	13.54	7.5	13.48	9.49	7.6	42.17	47.26
8.5	46.91	58.38	8.5	51.22	53.52	8.5	45.45	13.84	8.5	14.12	9.79	8.6	42.20	47.59
9.5	46.72	58.64	9.5	51.22	53.86	9.5	45.07	14.14	9.5	14.67	10.10	9.6	42.24	47.91
10.4	46.55	58.90	10.5	51.17	54.20	10.5	44.75	14.43	10.5	15.12	10.42	10.6	42.28	48.23
11.4	46.38	59.17	11.5	51.08	54.53	11.5	44.47	14.75	11.5	15.44	10.75	11.6	42.31	48.53
12.4	46.22	59.44	12.4	50.97	54.83	12.5	44.23	15.05	12.5	15.67	11.08	12.6	42.36	48.85
13.4	46.06	59.74	13.4	50.85	55.12	13.5	43.97	15.36	13.5	15.83	11.38	13.6	42.40	49.18
14.4	45.89	60.05	14.4	50.72	55.40	14.5	43.71	15.69	14.5	15.95	11.67	14.6	42.45	49.52
15.4	45.71	60.37	15.4	50.58	55.67	15.5	43.41	16.02	15.5	16.05	11.96	15.6	42.50	49.88
16.4	45.52	60.69	16.4	50.45	55.93	16.5	43.05	16.39	16.5	16.16	12.23	16.5	42.54	50.25
17.4	45.30	61.01	17.4	50.34	56.17	17.5	42.65	16.75	17.5	16.30	12.51	17.5	42.58	50.63
18.4	45.07	61.32	18.4	50.26	56.43	18.5	42.16	17.11	18.5	16.48	12.77	18.5	42.62	51.02
19.4	44.81	61.61	19.4	50.18	56.69	19.5	41.58	17.45	19.5	16.71	13.03	19.5	42.65	51.40
20.4	44.54	61.90	20.4	50.10	56.96	20.5	40.95	17.79	20.5	16.99	13.30	20.5	42.66	51.79
21.4	44.26	62.17	21.4	50.04	57.24	21.5	40.27	18.12	21.5	17.28	13.58	21.5	42.67	52.17
22.4	43.98	62.42	22.4	49.96	57.55	22.5	39.56	18.42	22.5	17.57	13.89	22.5	42.68	52.54
23.4	43.70	62.65	23.4	49.84	57.87	23.5	38.85	18.70	23.5	17.79	14.20	23.5	42.65	52.88
24.4	43.43	62.87	24.4	49.69	58.18	24.5	38.18	18.98	24.5	17.92	14.54	24.5	42.65	53.22
25.4	43.19	63.09	25.4	49.50	58.48	25.5	37.55	19.25	25.5	17.91	14.86	25.5	42.65	53.56
26.4	42.95	63.32	26.4	49.27	58.77	26.4	36.99	19.52	26.5	17.78	15.19	26.5	42.66	53.88
27.4	42.71	63.58	27.4	49.01	59.05	27.4	36.45	19.83	27.5	17.55	15.50	27.5	42.66	54.22
28.4	42.47	63.85	28.4	48.76	59.29	28.4	35.91	20.14	28.5	17.26	15.79	28.5	42.67	54.58
29.4	42.20	64.14	29.4	48.52	59.51	29.4	35.33	20.47	29.5	16.97	16.07	29.5	42.69	54.95
30.4	41.93	64.44	30.4	48.29	59.73	30.4	34.66	20.84	30.5	16.73	16.33	30.5	42.70	55.36
31.4	41.62	64.73	31.4	48.09	59.95	31.4	33.90	21.19	31.5	16.56	16.58	31.5	42.70	55.77
32.4	41.29	65.00	32.4	47.92	60.18	32.4	33.04	21.52	32.5	16.45	16.84	32.5	42.69	56.17
16.95	+16.92		24.55	-24.53		58.53	+58.53		73.46	-73.45		7.40	+7.33	
17 ^h 58 ^m	41° 8' 09"		18 ^h 6 ^m	47° 6' 20"		19 ^h 1 ^m	27° 46' 3"		19 ^h 29 ^m	16° 7' 46"		20 ^h 48 ^m	36° 32' 3"	
+86° 36'	51° 12'		-87° 39'	51° 38'		+89° 1'	7° 53'		-89° 13'	21° 02'		+82° 13'	43° 34'	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
July	21 38	-83 5	July	22 16	-86 22	July	22 37	-81 48	July	23 27	+86 51	July	23 47	-82 27
	s	"		s	"		s	"		s	"		s	"
1.6	44.15	21.14	1.7	41.92	36.16	1.7	54.59	9.32	1.7	52.95	16.33	1.7	24.37	51.46
2.6	44.27	21.28	2.6	42.17	36.27	2.7	54.71	9.39	2.7	53.37	16.51	2.7	24.51	51.46
3.6	44.41	21.41	3.6	42.44	36.37	3.7	54.84	9.45	3.7	53.78	16.71	3.7	24.65	51.46
4.6	44.55	21.53	4.6	42.72	36.46	4.7	54.97	9.49	4.7	54.18	16.93	4.7	24.80	51.43
5.6	44.70	21.65	5.6	43.03	36.55	5.7	55.11	9.54	5.7	54.56	17.15	5.7	24.97	51.40
6.6	44.87	21.79	6.6	43.34	36.66	6.7	55.26	9.61	6.7	54.90	17.39	6.7	25.14	51.37
7.6	45.04	21.95	7.6	43.66	36.79	7.6	55.42	9.69	7.7	55.23	17.62	7.7	25.33	51.35
8.6	45.20	22.13	8.6	44.00	36.93	8.6	55.58	9.80	8.7	55.52	17.85	8.7	25.51	51.35
9.6	45.35	22.32	9.6	44.32	37.10	9.6	55.74	9.92	9.7	55.81	18.06	9.7	25.69	51.38
10.6	45.50	22.53	10.6	44.62	37.27	10.6	55.88	10.05	10.7	56.11	18.26	10.7	25.87	51.43
11.6	45.63	22.76	11.6	44.91	37.46	11.6	56.03	10.21	11.7	56.41	18.45	11.7	26.03	51.50
12.6	45.74	22.99	12.6	45.17	37.67	12.6	56.15	10.38	12.7	56.72	18.64	12.7	26.19	51.59
13.6	45.85	23.22	13.6	45.41	37.87	13.6	56.27	10.55	13.7	57.05	18.82	13.7	26.34	51.68
14.6	45.95	23.44	14.6	45.63	38.06	14.6	56.38	10.71	14.7	57.39	19.02	14.7	26.49	51.76
15.6	46.05	23.65	15.6	45.85	38.24	15.6	56.49	10.88	15.7	57.74	19.24	15.7	26.62	51.84
16.6	46.15	23.85	16.6	46.06	38.43	16.6	56.59	11.03	16.7	58.08	19.47	16.7	26.76	51.93
17.6	46.25	24.05	17.6	46.28	38.61	17.6	56.70	11.17	17.7	58.43	19.73	17.7	26.89	52.01
18.6	46.35	24.24	18.6	46.50	38.78	18.6	56.82	11.31	18.7	58.78	20.00	18.7	27.04	52.07
19.6	46.46	24.43	19.6	46.73	38.94	19.6	56.94	11.44	19.7	59.12	20.28	19.7	27.18	52.13
20.6	46.59	24.62	20.6	46.98	39.11	20.6	57.06	11.58	20.6	59.42	20.57	20.7	27.33	52.20
21.6	46.72	24.83	21.6	47.25	39.28	21.6	57.20	11.72	21.6	59.70	20.86	21.7	27.49	52.27
22.6	46.84	25.05	22.6	47.52	39.46	22.6	57.33	11.88	22.6	59.96	21.15	22.7	27.66	52.35
23.6	46.96	25.28	23.6	47.79	39.68	23.6	57.46	12.05	23.6	60.20	21.44	23.7	27.83	52.44
24.6	47.08	25.53	24.6	48.04	39.90	24.6	57.59	12.25	24.6	60.43	21.72	24.7	28.00	52.55
25.6	47.18	25.80	25.6	48.28	40.16	25.6	57.70	12.46	25.6	60.66	21.99	25.6	28.16	52.68
26.6	47.27	26.08	26.6	48.49	40.42	26.6	57.81	12.68	26.6	60.92	22.25	26.6	28.31	52.85
27.6	47.34	26.36	27.6	48.68	40.67	27.6	57.91	12.92	27.6	61.19	22.51	27.6	28.44	53.01
28.6	47.40	26.63	28.6	48.83	40.92	28.6	58.00	13.14	28.6	61.48	22.77	28.6	28.57	53.17
29.5	47.45	26.88	29.6	48.97	41.16	29.6	58.07	13.34	29.6	61.79	23.04	29.6	28.69	53.32
30.5	47.51	27.12	30.6	49.12	41.39	30.6	58.16	13.54	30.6	62.10	23.35	30.6	28.80	53.47
31.5	47.58	27.34	31.6	49.28	41.59	31.6	58.24	13.72	31.6	62.39	23.67	31.6	28.91	53.60
32.5	47.66	27.56	32.6	49.45	41.78	32.6	58.33	13.90	32.6	62.68	23.99	32.6	29.03	53.71
8.31	-8.25		15.83	-15.79		7.01	-6.94		18.23	+18.20		7.63	-7.56	
21 ^h 38 ^m	29 ^s .050		22 ^h 16 ^m	20 ^s .949		22 ^h 37 ^m	45 ^s .323		23 ^h 27 ^m	43 ^s .851		23 ^h 47 ^m	20 ^s .032	
-83° 5'	50''.66		-86° 23'	9''.03		-81° 48'	43''.57		+86° 51'	18''.76		-82° 28'	28''.42	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '
	0 57	+85 49		1 31	+88 51		1 41	-85 10		4 10	+85 20		5 35	+85 9
	s	"		s	"		s	"		s	"		s	"
0.7	32.36	4.52	0.7	30.55	59.55	0.7	56.69	27.20	0.8	30.16	9.48	0.9	37.77	19.82
1.7	32.68	4.75	1.7	31.77	59.73	1.7	56.91	27.20	1.8	30.49	9.41	1.9	38.04	19.61
2.7	32.97	4.99	2.7	32.93	59.93	2.7	57.14	27.20	2.8	30.83	9.35	2.9	38.32	19.41
3.7	33.25	5.25	3.7	34.01	60.15	3.7	57.39	27.19	3.8	31.15	9.32	3.9	38.60	19.25
4.7	33.50	5.50	4.7	35.01	60.36	4.7	57.65	27.19	4.8	31.45	9.30	4.9	38.87	19.10
5.7	33.74	5.75	5.7	35.97	60.56	5.7	57.91	27.22	5.8	31.74	9.29	5.9	39.12	18.96
6.7	33.96	5.98	6.7	36.90	60.76	6.7	58.18	27.26	6.8	32.01	9.27	6.9	39.35	18.83
7.7	34.20	6.22	7.7	37.83	60.94	7.7	58.45	27.32	7.8	32.29	9.24	7.9	39.59	18.68
8.7	34.43	6.45	8.7	38.79	61.10	8.7	58.71	27.41	8.8	32.56	9.19	8.9	39.82	18.51
9.7	34.67	6.65	9.7	39.76	61.27	9.7	58.95	27.51	9.8	32.83	9.14	9.8	40.04	18.35
10.7	34.92	6.87	10.7	40.78	61.44	10.7	59.18	27.64	10.8	33.11	9.09	10.8	40.27	18.18
11.7	35.19	7.09	11.7	41.85	61.61	11.7	59.41	27.77	11.8	33.40	9.02	11.8	40.51	17.98
12.6	35.46	7.32	12.7	42.93	61.79	12.7	59.62	27.88	12.8	33.71	8.97	12.8	40.76	17.80
13.6	35.73	7.56	13.7	44.05	62.00	13.7	59.83	27.99	13.8	34.02	8.92	13.8	41.03	17.63
14.6	36.01	7.83	14.7	45.15	62.22	14.7	60.04	28.10	14.8	34.34	8.88	14.8	41.31	17.45
15.6	36.28	8.12	15.7	46.25	62.44	15.7	60.24	28.19	15.8	34.68	8.86	15.8	41.61	17.29
16.6	36.55	8.42	16.7	47.32	62.68	16.7	60.45	28.28	16.8	35.02	8.86	16.8	41.92	17.15
17.6	36.79	8.73	17.7	48.33	62.95	17.7	60.67	28.37	17.8	35.36	8.89	17.8	42.23	17.03
18.6	37.01	9.05	18.7	49.29	63.23	18.7	60.90	28.45	18.8	35.70	8.93	18.8	42.53	16.92
19.6	37.22	9.36	19.7	50.17	63.51	19.7	61.14	28.54	19.8	36.01	8.99	19.8	42.83	16.83
20.6	37.41	9.65	20.6	51.01	63.77	20.7	61.39	28.65	20.8	36.31	9.05	20.8	43.12	16.76
21.6	37.60	9.94	21.6	51.81	64.02	21.7	61.63	28.78	21.8	36.60	9.11	21.8	43.39	16.69
22.6	37.79	10.22	22.6	52.63	64.26	22.7	61.87	28.94	22.8	36.87	9.13	22.8	43.64	16.59
23.6	38.00	10.49	23.6	53.49	64.48	23.6	62.09	29.12	23.8	37.15	9.13	23.8	43.89	16.49
24.6	38.22	10.76	24.6	54.40	64.70	24.6	62.29	29.30	24.8	37.45	9.14	24.8	44.16	16.37
25.6	38.44	11.03	25.6	55.38	64.94	25.6	62.49	29.49	25.7	37.76	9.14	25.8	44.43	16.23
26.6	38.69	11.30	26.6	56.42	65.19	26.6	62.66	29.68	26.7	38.08	9.14	26.8	44.72	16.08
27.6	38.93	11.62	27.6	57.46	65.45	27.6	62.82	29.86	27.7	38.43	9.17	27.8	45.04	15.95
28.6	39.17	11.97	28.6	58.48	65.75	28.6	62.99	30.02	28.7	38.78	9.21	28.8	45.38	15.85
29.6	39.41	12.33	29.6	59.45	66.07	29.6	63.17	30.17	29.7	39.13	9.26	29.8	45.72	15.74
30.6	39.61	12.69	30.6	60.32	66.37	30.6	63.37	30.32	30.7	39.47	9.35	30.8	46.04	15.69
31.6	39.79	13.05	31.6	61.13	66.69	31.6	63.58	30.47	31.7	39.80	9.46	31.8	46.36	15.64
13.72	+13.68		50.59	+50.58		11.89	-11.85		12.30	+12.26		11.84	+11.80	
0 ^h 57 ^m	16° 55'		1 ^h 30 ^m	42° 30'		1 ^h 41 ^m	58° 58'		4 ^h 10 ^m	20° 18'		5 ^h 35 ^m	31° 54'	
+85° 49'	4'' 72		+88° 52'	2'' 06		-85° 11'	3'' 34		+85° 20'	19'' 62		+85° 9'	32'' 39	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Ootantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m s	° ' "	Aug.	h m s	° ' "	Aug.	h m s	° ' "	Aug.	h m s	° ' "	Aug.	h m s	° ' "
	5 45	-84 49		6 46	-80 43		7 2	+87 10		7 13	+82 34		7 15	-86 54
0.9	40.73	33.05	0.9	41.63	38.70	0.9	34.85	35.81	0.9	57.13	10.73	0.9	18.22	14.85
1.9	40.85	32.82	1.9	41.67	38.44	1.9	35.17	35.49	1.9	57.25	10.40	1.9	18.28	14.59
2.9	40.97	32.56	2.9	41.71	38.16	2.9	35.51	35.20	2.9	57.39	10.10	2.9	18.34	14.31
3.9	41.09	32.30	3.9	41.76	37.87	3.9	35.86	34.91	3.9	57.52	9.82	3.9	18.40	14.01
4.9	41.22	32.03	4.9	41.81	37.56	4.9	36.20	34.66	4.9	57.65	9.57	4.9	18.48	13.70
5.9	41.37	31.75	5.9	41.86	37.24	5.9	36.53	34.42	5.9	57.78	9.33	5.9	18.58	13.37
6.9	41.54	31.49	6.9	41.93	36.92	6.9	36.83	34.17	6.9	57.87	9.09	6.9	18.71	13.05
7.9	41.71	31.23	7.9	42.01	36.61	7.9	37.11	33.92	7.9	57.98	8.83	7.9	18.85	12.72
8.9	41.89	31.00	8.9	42.08	36.30	8.9	37.39	33.66	8.9	58.08	8.57	8.9	19.03	12.41
9.9	42.07	30.78	9.9	42.15	36.02	9.9	37.66	33.39	9.9	58.18	8.31	9.9	19.22	12.13
10.9	42.25	30.59	10.9	42.23	35.76	10.9	37.93	33.12	10.9	58.28	8.04	10.9	19.41	11.84
11.9	42.44	30.40	11.9	42.31	35.51	11.9	38.22	32.84	11.9	58.39	7.76	11.9	19.61	11.57
12.8	42.62	30.22	12.9	42.40	35.27	12.9	38.53	32.55	12.9	58.51	7.47	12.9	19.80	11.34
13.8	42.80	30.04	13.9	42.47	35.04	13.9	38.86	32.25	13.9	58.63	7.17	13.9	19.99	11.10
14.8	42.97	29.87	14.9	42.56	34.83	14.9	39.21	31.95	14.9	58.76	6.86	14.9	20.18	10.88
15.8	43.14	29.70	15.9	42.63	34.60	15.9	39.59	31.67	15.9	58.89	6.58	15.9	20.36	10.65
16.8	43.31	29.52	16.9	42.72	34.37	16.9	40.00	31.39	16.9	59.06	6.30	16.9	20.52	10.38
17.8	43.48	29.32	17.9	42.79	34.13	17.9	40.42	31.15	17.9	59.23	6.06	17.9	20.68	10.13
18.8	43.64	29.12	18.9	42.86	33.86	18.9	40.86	30.92	18.9	59.39	5.81	18.9	20.85	9.86
19.8	43.82	28.90	19.9	42.94	33.59	19.9	41.27	30.70	19.9	59.54	5.58	19.9	21.02	9.57
20.8	44.01	28.69	20.9	43.02	33.32	20.9	41.69	30.49	20.9	59.69	5.38	20.9	21.22	9.28
21.8	44.22	28.49	21.9	43.12	33.05	21.9	42.06	30.31	21.9	59.84	5.18	21.9	21.44	8.99
22.8	44.44	28.31	22.9	43.22	32.80	22.9	42.42	30.09	22.9	59.97	4.96	22.9	21.70	8.72
23.8	44.66	28.17	23.9	43.32	32.57	23.9	42.77	29.87	23.9	60.10	4.74	23.9	21.96	8.47
24.8	44.89	28.03	24.9	43.42	32.37	24.9	43.12	29.64	24.9	60.23	4.49	24.9	22.24	8.24
25.8	45.10	27.92	25.9	43.53	32.19	25.9	43.48	29.38	25.9	60.37	4.22	25.9	22.53	8.04
26.8	45.30	27.82	26.9	43.64	32.02	26.9	43.88	29.12	26.9	60.51	3.95	26.9	22.80	7.85
27.8	45.50	27.72	27.8	43.75	31.86	27.9	44.32	28.85	27.9	60.68	3.67	27.9	23.06	7.67
28.8	45.69	27.62	28.8	43.84	31.70	28.9	44.77	28.60	28.9	60.86	3.41	28.9	23.30	7.49
29.8	45.88	27.52	29.8	43.94	31.54	29.9	45.25	28.36	29.9	61.04	3.16	29.9	23.54	7.30
30.8	46.08	27.39	30.8	44.03	31.35	30.9	45.74	28.16	30.9	61.23	2.94	30.9	23.77	7.08
31.8	46.27	27.26	31.8	44.13	31.13	31.8	46.22	27.98	31.9	61.41	2.75	31.9	24.01	6.84
11.09	-11.04		6.20	-6.12		20.29	+20.27		7.73	+7.67		18.51	-18.48	
5 ^h 46 ^m	3°.075		6 ^h 46 ^m	53°.600		7 ^h 2 ^m	33°.206		7 ^h 13 ^m	55°.106		7 ^h 16 ^m	0°.004	
-84° 49'	45'' 59		-80° 43'	42'' 15		+87° 10'	49'' 32		+82° 34'	23'' 73		-86° 54'	13'' 24	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "
Aug.	10 59	-84 9	Aug.	12 13	+88 9	Aug.	12 46	-84 41	Aug.	12 48	+83 51	Aug.	13 27	-85 22
1.1	45.54	40.44	1.1	63.38	14.26	1.2	14.01	17.56	1.2	25.15	31.33	1.2	29.63	36.46
2.1	45.44	40.25	2.1	62.85	13.97	2.2	13.84	17.48	2.2	24.97	31.09	2.2	29.41	36.43
3.1	45.31	40.06	3.1	62.36	13.66	3.2	13.66	17.39	3.2	24.81	30.84	3.2	29.20	36.40
4.1	45.17	39.84	4.1	61.90	13.37	4.2	13.46	17.30	4.2	24.66	30.59	4.2	28.97	36.37
5.1	45.04	39.62	5.1	61.49	13.08	5.2	13.24	17.20	5.2	24.52	30.34	5.2	28.71	36.32
6.1	44.90	39.36	6.1	61.10	12.81	6.2	13.02	17.07	6.2	24.38	30.12	6.2	28.44	36.24
7.1	44.76	39.10	7.1	60.69	12.55	7.2	12.82	16.93	7.2	24.24	29.89	7.2	28.17	36.15
8.1	44.64	38.82	8.1	60.28	12.31	8.2	12.62	16.75	8.2	24.09	29.66	8.2	27.93	36.02
9.1	44.54	38.52	9.1	59.84	12.06	9.1	12.42	16.57	9.2	23.95	29.46	9.2	27.68	35.90
10.1	44.44	38.23	10.1	59.38	11.81	10.1	12.23	16.37	10.1	23.78	29.26	10.2	27.44	35.76
11.1	44.35	37.93	11.1	58.90	11.55	11.1	12.05	16.17	11.1	23.62	29.05	11.2	27.21	35.61
12.1	44.27	37.65	12.1	58.40	11.29	12.1	11.89	15.97	12.1	23.44	28.83	12.2	27.00	35.45
13.1	44.21	37.38	13.1	57.90	11.01	13.1	11.74	15.78	13.1	23.27	28.61	13.2	26.80	35.31
14.1	44.15	37.14	14.1	57.39	10.70	14.1	11.59	15.60	14.1	23.10	28.35	14.2	26.61	35.17
15.1	44.07	36.89	15.1	56.92	10.40	15.1	11.45	15.44	15.1	22.93	28.08	15.2	26.42	35.04
16.1	44.00	36.65	16.1	56.49	10.08	16.1	11.30	15.29	16.1	22.79	27.80	16.2	26.23	34.92
17.1	43.92	36.40	17.1	56.07	9.75	17.1	11.15	15.14	17.1	22.65	27.49	17.2	26.04	34.82
18.0	43.85	36.14	18.1	55.71	9.39	18.1	10.99	14.97	18.1	22.51	27.18	18.2	25.84	34.70
19.0	43.76	35.88	19.1	55.39	9.03	19.1	10.81	14.80	19.1	22.39	26.87	19.2	25.62	34.57
20.0	43.66	35.60	20.1	55.10	8.69	20.1	10.63	14.62	20.1	22.27	26.56	20.1	25.38	34.44
21.0	43.57	35.29	21.1	54.82	8.37	21.1	10.45	14.41	21.1	22.17	26.26	21.1	25.15	34.28
22.0	43.49	34.98	22.1	54.54	8.05	22.1	10.28	14.19	22.1	22.06	25.98	22.1	24.91	34.11
23.0	43.43	34.66	23.1	54.22	7.75	23.1	10.10	13.94	23.1	21.94	25.71	23.1	24.68	33.90
24.0	43.38	34.34	24.1	53.87	7.44	24.1	9.96	13.68	24.1	21.80	25.45	24.1	24.47	33.70
25.0	43.34	34.03	25.1	53.47	7.15	25.1	9.83	13.41	25.1	21.66	25.19	25.1	24.29	33.48
26.0	43.31	33.75	26.1	53.06	6.84	26.1	9.71	13.16	26.1	21.52	24.92	26.1	24.11	33.28
27.0	43.29	33.47	27.1	52.64	6.49	27.1	9.61	12.93	27.1	21.37	24.61	27.1	23.97	33.08
28.0	43.28	33.20	28.1	52.25	6.12	28.1	9.51	12.72	28.1	21.22	24.29	28.1	23.83	32.88
29.0	43.26	32.92	29.1	51.91	5.76	29.1	9.41	12.51	29.1	21.09	23.93	29.1	23.68	32.71
30.0	43.22	32.65	30.1	51.62	5.36	30.1	9.28	12.29	30.1	20.96	23.58	30.1	23.52	32.54
31.0	43.19	32.38	31.1	51.37	4.97	31.1	9.16	12.07	31.1	20.87	23.22	31.1	23.34	32.37
32.0	43.15	32.07	32.1	51.16	4.59	32.1	9.03	11.85	32.1	20.78	22.87	32.1	23.15	32.18
9.83 -9.78			31.03 +31.01			10.80 -10.75			9.35 +9.29			12.40 -12.36		
10 ^h 59 ^m 54 ^s .915			12 ^h 14 ^m 28 ^s .804			12 ^h 46 ^m 13 ^s .131			12 ^h 48 ^m 30 ^s .862			13 ^h 27 ^m 23 ^s .749		
-84° 9' 9".97			+88° 9' 16".14			-84° 40' 41".95			+83° 51' 30".88			-85° 22' 0".86		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 3283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m	° ' "	Aug.	h m	° ' "	Aug.	h m	° ' "	Aug.	h m	° ' "	Aug.	h m	° ' "
	14 13	-83 18		15 2	+87 33		15 24	-84 12		16 54	+82 10		17 16	-80 47
	s	"		s	"		s	"		s	"		s	"
	46.07	11.65	1.3	66.70	4.45	1.3	26.58	11.96	1.3	18.95	39.83	1.4	22.31	25.92
2.2	45.94	11.69	2.3	66.09	4.42	2.3	26.43	12.06	2.3	18.77	39.98	2.4	22.26	26.12
3.2	45.79	11.71	3.3	65.52	4.36	3.3	26.27	12.17	3.3	18.62	40.11	3.4	22.20	26.33
4.2	45.63	11.73	4.3	64.96	4.28	4.3	26.10	12.28	4.3	18.47	40.23	4.4	22.14	26.55
5.2	45.45	11.74	5.3	64.44	4.20	5.3	25.91	12.39	5.3	18.31	40.33	5.3	22.06	26.77
6.2	45.27	11.73	6.3	63.94	4.14	6.3	25.70	12.48	6.3	18.16	40.43	6.3	21.96	26.99
7.2	45.09	11.69	7.3	63.43	4.08	7.3	25.50	12.54	7.3	18.01	40.53	7.3	21.87	27.19
8.2	44.91	11.64	8.2	62.93	4.03	8.3	25.30	12.59	8.3	17.86	40.66	8.3	21.76	27.38
9.2	44.73	11.56	9.2	62.43	3.99	9.3	25.08	12.61	9.3	17.72	40.79	9.3	21.65	27.55
10.2	44.55	11.48	10.2	61.91	3.96	10.3	24.88	12.62	10.3	17.57	40.93	10.3	21.54	27.70
11.2	44.37	11.38	11.2	61.36	3.94	11.3	24.67	12.61	11.3	17.40	41.07	11.3	21.44	27.84
12.2	44.21	11.29	12.2	60.80	3.91	12.3	24.48	12.59	12.3	17.24	41.21	12.3	21.34	27.97
13.2	44.06	11.19	13.2	60.23	3.86	13.2	24.29	12.61	13.3	17.07	41.36	13.3	21.23	28.07
14.2	43.93	11.09	14.2	59.64	3.81	14.2	24.12	12.60	14.3	16.90	41.49	14.3	21.13	28.19
15.2	43.79	11.02	15.2	59.04	3.73	15.2	23.95	12.60	15.3	16.72	41.60	15.3	21.04	28.31
16.2	43.65	10.96	16.2	58.46	3.64	16.2	23.79	12.62	16.3	16.54	41.70	16.3	20.96	28.44
17.2	43.51	10.90	17.2	57.87	3.53	17.2	23.63	12.65	17.3	16.36	41.77	17.3	20.87	28.59
18.2	43.36	10.83	18.2	57.31	3.40	18.2	23.45	12.67	18.3	16.18	41.82	18.3	20.79	28.73
19.2	43.20	10.77	19.2	56.76	3.25	19.2	23.25	12.70	19.3	16.01	41.87	19.3	20.70	28.91
20.2	43.03	10.69	20.2	56.26	3.10	20.2	23.06	12.71	20.3	15.84	41.91	20.3	20.60	29.07
21.2	42.86	10.60	21.2	55.76	2.95	21.2	22.84	12.72	21.3	15.68	41.95	21.3	20.49	29.22
22.2	42.68	10.47	22.2	55.27	2.81	22.2	22.63	12.70	22.3	15.51	41.98	22.3	20.37	29.36
23.2	42.51	10.33	23.2	54.78	2.69	23.2	22.41	12.66	23.3	15.35	42.03	23.3	20.24	29.46
24.2	42.34	10.16	24.2	54.28	2.59	24.2	22.21	12.58	24.3	15.18	42.12	24.3	20.11	29.55
25.2	42.20	9.99	25.2	53.73	2.50	25.2	22.01	12.50	25.3	15.01	42.21	25.3	19.99	29.61
26.2	42.06	9.82	26.2	53.16	2.40	26.2	21.83	12.41	26.3	14.83	42.29	26.3	19.86	29.66
27.2	41.93	9.65	27.2	52.57	2.28	27.2	21.66	12.32	27.3	14.65	42.36	27.3	19.77	29.70
28.2	41.81	9.50	28.2	51.97	2.14	28.2	21.50	12.26	28.3	14.46	42.42	28.3	19.68	29.74
29.2	41.70	9.36	29.2	51.38	1.97	29.2	21.34	12.21	29.3	14.27	42.46	29.3	19.58	29.81
30.2	41.57	9.23	30.2	50.82	1.78	30.2	21.18	12.16	30.3	14.09	42.46	30.3	19.49	29.90
31.1	41.44	9.11	31.2	50.28	1.57	31.2	21.01	12.11	31.3	13.89	42.44	31.3	19.39	29.99
32.1	41.29	8.98	32.2	49.78	1.35	32.2	20.82	12.07	32.3	13.72	42.41	32.3	19.27	30.10
8.58	-8.52		23.40	+23.38		9.90	-9.85		7.35	+7.28		6.25	-6.17	
14 ^h 13 ^m 37 ^s .066			15 ^h 3 ^m 21 ^s .809			15 ^h 24 ^m 9 ^s .966			16 ^h 54 ^m 19 ^s .238			17 ^h 16 ^m 6 ^s .064		
-83° 17' 37".78			+87° 32' 56".60			-84° 11' 42".92			+82° 10' 27".09			-80° 47' 10".43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Aug.	h m s	° ' "	Aug.	h m s	° ' "	Aug.	h m s	° ' "	Aug.	h m s	° ' "	Aug.	h m s	° ' "
	17 58	+86 37		18 7	-87 40		19 1	+89 1		19 31	-89 13		20 48	+82 13
1.4	41.29	5.00	1.4	47.92	0.18	1.4	33.04	21.52	1.5	76.45	16.84	1.5	42.69	56.17
2.4	40.95	5.23	2.4	47.76	0.42	2.4	32.12	21.84	2.4	76.40	17.10	2.5	42.68	56.58
3.4	40.60	5.46	3.4	47.58	0.69	3.4	31.17	22.12	3.4	76.33	17.39	3.5	42.64	56.96
4.4	40.26	5.66	4.4	47.36	0.95	4.4	30.22	22.40	4.4	76.22	17.70	4.5	42.60	57.33
5.4	39.93	5.85	5.4	47.14	1.24	5.4	29.31	22.66	5.4	76.04	18.02	5.5	42.57	57.68
6.4	39.61	6.04	6.4	46.85	1.52	6.4	28.42	22.90	6.4	75.74	18.33	6.5	42.54	58.01
7.4	39.32	6.23	7.4	46.54	1.79	7.4	27.59	23.16	7.4	75.32	18.64	7.5	42.50	58.33
8.4	39.03	6.42	8.4	46.19	2.03	8.4	26.79	23.42	8.4	74.80	18.96	8.5	42.46	58.65
9.4	38.73	6.62	9.4	45.82	2.27	9.4	26.01	23.68	9.4	74.21	19.28	9.5	42.44	58.98
10.4	38.42	6.83	10.4	45.46	2.50	10.4	25.23	23.96	10.4	73.57	19.56	10.5	42.41	59.33
11.4	38.11	7.06	11.4	45.09	2.69	11.4	24.42	24.25	11.4	72.89	19.84	11.5	42.38	59.70
12.4	37.80	7.29	12.4	44.72	2.88	12.4	23.59	24.55	12.4	72.22	20.10	12.5	42.36	60.07
13.4	37.46	7.51	13.4	44.38	3.06	13.4	22.68	24.85	13.4	71.56	20.36	13.5	42.33	60.44
14.4	37.10	7.72	14.4	44.04	3.23	14.4	21.71	25.15	14.4	70.95	20.60	14.5	42.30	60.83
15.4	36.74	7.95	15.4	43.73	3.41	15.4	20.67	25.44	15.4	70.38	20.83	15.5	42.26	61.22
16.3	36.35	8.15	16.4	43.43	3.60	16.4	19.57	25.72	16.4	69.86	21.09	16.5	42.21	61.61
17.3	35.96	8.33	17.4	43.14	3.80	17.4	18.41	25.99	17.4	69.37	21.35	17.5	42.15	61.99
18.3	35.57	8.48	18.3	42.83	4.02	18.4	17.21	26.23	18.4	68.88	21.61	18.5	42.07	62.35
19.3	35.18	8.62	19.3	42.52	4.24	19.4	16.03	26.46	19.4	68.36	21.88	19.5	41.99	62.69
20.3	34.79	8.74	20.3	42.16	4.47	20.4	14.85	26.67	20.4	67.76	22.18	20.5	41.91	63.02
21.3	34.41	8.87	21.3	41.77	4.69	21.4	13.72	26.87	21.4	67.06	22.48	21.5	41.85	63.34
22.3	34.06	8.98	22.3	41.35	4.90	22.4	12.66	27.07	22.4	66.22	22.77	22.4	41.79	63.65
23.3	33.72	9.14	23.3	40.89	5.09	23.4	11.64	27.29	23.4	65.28	23.04	23.4	41.72	63.97
24.3	33.37	9.31	24.3	40.43	5.24	24.4	10.65	27.53	24.4	64.26	23.27	24.4	41.66	64.30
25.3	33.00	9.48	25.3	39.97	5.39	25.4	9.62	27.79	25.4	63.22	23.49	25.4	41.60	64.65
26.3	32.62	9.66	26.3	39.54	5.49	26.4	8.52	28.05	26.4	62.21	23.69	26.4	41.55	65.02
27.3	32.22	9.84	27.3	39.14	5.59	27.4	7.35	28.31	27.4	61.26	23.90	27.4	41.47	65.40
28.3	31.81	10.01	28.3	38.76	5.72	28.4	6.10	28.58	28.4	60.40	24.10	28.4	41.40	65.79
29.3	31.37	10.15	29.3	38.39	5.85	29.4	4.77	28.83	29.4	59.60	24.31	29.4	41.32	66.16
30.3	30.94	10.26	30.3	38.04	6.00	30.4	3.39	29.04	30.4	58.82	24.53	30.4	41.23	66.53
31.3	30.50	10.36	31.3	37.66	6.16	31.3	2.02	29.24	31.4	58.01	24.75	31.4	41.13	66.86
32.3	30.07	10.44	32.3	37.25	6.33	32.3	0.68	29.42	32.4	57.14	24.99	32.4	41.02	67.18
16.96	+16.93		24.57	-24.55		58.69	+58.68		73.69	-73.68		7.40	+7.33	
17 ^h 58 ^m 41 ^s .809			18 ^h 7 ^m 47 ^s .620			19 ^h 1 ^m 27 ^s .463			19 ^h 31 ^m 16 ^s .746			20 ^h 48 ^m 36 ^s .323		
+86° 36' 51".12			-87° 39' 51".38			+89° 1' 7".53			-89° 13' 21".02			+82° 13' 43".34		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Aug.	h ^m	° ' "	Aug.	h m	° ' "	Aug.	h m	° ' "	Aug.	h m	° ' "	Aug.	h m	° ' "
	21 38	-83 5		22 16	-86 22		22 37	-81 48		23 28	+86 51		23 47	-82 27
1.5	47.66	27.56	1.6	49.45	41.78	1.6	58.33	13.90	1.6	2.68	23.99	1.6	29.03	53.71
2.5	47.75	27.78	2.6	49.63	42.00	2.6	58.43	14.09	2.6	2.92	24.33	2.6	29.17	53.83
3.5	47.84	28.01	3.6	49.84	42.24	3.6	58.53	14.29	3.6	3.14	24.68	3.6	29.31	53.96
4.5	47.93	28.28	4.6	50.05	42.49	4.6	58.64	14.51	4.6	3.33	25.03	4.6	29.46	54.11
5.5	48.01	28.56	5.6	50.25	42.75	5.6	58.74	14.74	5.6	3.52	25.36	5.6	29.61	54.28
6.5	48.08	28.86	6.6	50.43	43.03	6.6	58.84	14.99	6.6	3.69	25.68	6.6	29.75	54.46
7.5	48.14	29.17	7.6	50.59	43.32	7.6	58.93	15.26	7.6	3.87	25.98	7.6	29.88	54.65
8.5	48.19	29.48	8.5	50.73	43.60	8.6	59.01	15.55	8.6	4.06	26.28	8.6	30.00	54.87
9.5	48.22	29.79	9.5	50.84	43.90	9.6	59.07	15.82	9.6	4.26	26.57	9.6	30.11	55.10
10.5	48.25	30.09	10.5	50.94	44.20	10.6	59.12	16.09	10.6	4.48	26.88	10.6	30.22	55.33
11.5	48.26	30.38	11.5	51.02	44.50	11.6	59.18	16.36	11.6	4.71	27.19	11.6	30.32	55.57
12.5	48.27	30.67	12.5	51.10	44.77	12.6	59.23	16.63	12.6	4.93	27.50	12.6	30.41	55.80
13.5	48.29	30.94	13.5	51.17	45.04	13.5	59.28	16.88	13.6	5.16	27.83	13.6	30.50	56.02
14.5	48.32	31.20	14.5	51.25	45.29	14.5	59.33	17.12	14.6	5.38	28.19	14.6	30.59	56.22
15.5	48.35	31.46	15.5	51.33	45.54	15.5	59.38	17.36	15.6	5.58	28.55	15.6	30.68	56.43
16.5	48.37	31.70	16.5	51.42	45.79	16.5	59.44	17.59	16.6	5.77	28.93	16.6	30.78	56.63
17.5	48.41	31.96	17.5	51.53	46.05	17.5	59.50	17.82	17.6	5.92	29.31	17.6	30.89	56.81
18.5	48.45	32.23	18.5	51.66	46.32	18.5	59.57	18.07	18.6	6.06	29.70	18.6	31.01	57.01
19.5	48.50	32.52	19.5	51.78	46.61	19.5	59.64	18.34	19.6	6.17	30.07	19.6	31.13	57.22
20.5	48.53	32.83	20.5	51.89	46.92	20.5	59.71	18.62	20.6	6.27	30.43	20.6	31.24	57.45
21.5	48.55	33.15	21.5	51.99	47.23	21.5	59.78	18.92	21.6	6.36	30.78	21.6	31.34	57.69
22.5	48.56	33.48	22.5	52.06	47.55	22.5	59.83	19.23	22.6	6.47	31.11	22.6	31.43	57.97
23.5	48.55	33.80	23.5	52.09	47.88	23.5	59.86	19.56	23.6	6.59	31.43	23.6	31.52	58.25
24.5	48.52	34.11	24.5	52.10	48.19	24.5	59.88	19.85	24.6	6.73	31.76	24.6	31.59	58.54
25.5	48.49	34.40	25.5	52.10	48.48	25.5	59.89	20.14	25.6	6.90	32.12	25.6	31.65	58.81
26.5	48.45	34.68	26.5	52.08	48.76	26.5	59.90	20.42	26.5	7.07	32.48	26.6	31.70	59.08
27.5	48.43	34.93	27.5	52.07	49.03	27.5	59.91	20.68	27.5	7.22	32.87	27.6	31.75	59.33
28.5	48.42	35.17	28.5	52.07	49.29	28.5	59.92	20.92	28.5	7.37	33.27	28.6	31.81	59.56
29.5	48.41	35.42	29.5	52.10	49.55	29.5	59.95	21.17	29.5	7.48	33.69	29.6	31.88	59.79
30.5	48.41	35.69	30.5	52.13	49.82	30.5	59.99	21.43	30.5	7.56	34.10	30.6	31.96	60.02
31.5	48.42	35.97	31.5	52.18	50.10	31.5	60.03	21.70	31.5	7.61	34.49	31.5	32.04	60.26
32.5	48.41	36.27	32.5	52.21	50.40	32.5	60.06	21.99	32.5	7.65	34.88	32.5	32.12	60.52
8.31	-8.25		15.83	-15.80		7.01	-6.94		18.24	+18.22		7.63	-7.56	
21 ^h 38 ^m	29°.050		22 ^h 16 ^m	20°.949		22 ^h 37 ^m	45°.323		23 ^h 27 ^m	43°.851		23 ^h 47 ^m	20°.032	
-83° 5'	50''.66		-86° 23'	9''.03		-81° 48'	43''.57		+86° 51'	18''.76		-82° 28'	28''.42	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursa Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "
	0 57	+85 49		1 32	+88 52		1 42	-85 10		4 10	+85 20		5 35	+85 9
	s	"		s	"		s	"		s	"		s	"
0.6	39.79	13.05	0.6	1.13	6.69	0.6	3.58	30.47	0.7	39.80	9.46	0.8	46.36	15.64
1.6	39.94	13.39	1.6	1.87	7.01	1.6	3.79	30.64	1.7	40.11	9.58	1.8	46.67	15.61
2.6	40.09	13.73	2.6	2.56	7.32	2.6	4.01	30.83	2.7	40.40	9.69	2.8	46.96	15.59
3.6	40.23	14.05	3.6	3.23	7.61	3.6	4.21	31.05	3.7	40.68	9.78	3.8	47.24	15.56
4.6	40.38	14.36	4.6	3.91	7.90	4.6	4.41	31.27	4.7	40.96	9.88	4.8	47.52	15.53
5.6	40.52	14.68	5.6	4.60	8.16	5.6	4.60	31.50	5.7	41.23	9.96	5.8	47.79	15.48
6.6	40.69	14.97	6.6	5.35	8.44	6.6	4.77	31.77	6.7	41.51	10.04	6.8	48.05	15.42
7.6	40.87	15.26	7.6	6.13	8.72	7.6	4.93	32.03	7.7	41.80	10.11	7.8	48.33	15.36
8.6	41.04	15.58	8.6	6.92	9.01	8.6	5.08	32.30	8.7	42.11	10.17	8.8	48.61	15.29
9.6	41.22	15.90	9.6	7.74	9.31	9.6	5.22	32.55	9.7	42.42	10.25	9.8	48.92	15.22
10.6	41.41	16.24	10.6	8.57	9.62	10.6	5.35	32.80	10.7	42.73	10.34	10.8	49.23	15.16
11.6	41.59	16.61	11.6	9.38	9.94	11.6	5.49	33.04	11.7	43.06	10.43	11.8	49.55	15.12
12.6	41.76	16.98	12.6	10.16	10.27	12.6	5.63	33.27	12.7	43.39	10.55	12.8	49.89	15.11
13.6	41.91	17.35	13.6	10.89	10.62	13.6	5.77	33.50	13.7	43.72	10.70	13.8	50.23	15.10
14.6	42.05	17.75	14.6	11.56	10.98	14.6	5.91	33.72	14.7	44.04	10.87	14.8	50.56	15.11
15.6	42.16	18.13	15.6	12.16	11.36	15.6	6.07	33.94	15.7	44.35	11.04	15.7	50.89	15.14
16.6	42.26	18.52	16.6	12.69	11.73	16.6	6.24	34.17	16.7	44.65	11.21	16.7	51.21	15.18
17.6	42.36	18.89	17.6	13.19	12.08	17.6	6.39	34.42	17.7	44.93	11.38	17.7	51.50	15.22
18.5	42.44	19.23	18.6	13.68	12.40	18.6	6.54	34.69	18.7	45.20	11.54	18.7	51.79	15.26
19.5	42.53	19.58	19.6	14.20	12.73	19.6	6.69	34.97	19.7	45.46	11.69	19.7	52.07	15.27
20.5	42.63	19.92	20.6	14.76	13.05	20.6	6.81	35.29	20.7	45.73	11.83	20.7	52.34	15.28
21.5	42.76	20.24	21.6	15.37	13.37	21.6	6.91	35.61	21.7	46.01	11.95	21.7	52.63	15.27
22.5	42.91	20.60	22.6	16.05	13.69	22.6	6.99	35.92	22.7	46.31	12.07	22.7	52.94	15.26
23.5	43.05	20.97	23.6	16.74	14.03	23.6	7.06	36.21	23.7	46.63	12.20	23.7	53.27	15.24
24.5	43.19	21.35	24.6	17.42	14.38	24.6	7.14	36.48	24.7	46.95	12.35	24.7	53.61	15.25
25.5	43.32	21.76	25.6	18.06	14.76	25.6	7.22	36.75	25.7	47.27	12.53	25.7	53.95	15.28
26.5	43.42	22.17	26.5	18.62	15.16	26.6	7.30	37.01	26.7	47.60	12.74	26.7	54.29	15.33
27.5	43.51	22.59	27.5	19.10	15.57	27.6	7.39	37.27	27.7	47.90	12.97	27.7	54.63	15.42
28.5	43.56	23.00	28.5	19.48	15.95	28.6	7.50	37.53	28.7	48.19	13.19	28.7	54.96	15.51
29.5	43.61	23.39	29.5	19.81	16.32	29.5	7.61	37.81	29.7	48.45	13.41	29.7	55.26	15.61
30.5	43.64	23.75	30.5	20.12	16.69	30.5	7.72	38.12	30.6	48.70	13.63	30.7	55.55	15.70
31.5	43.67	24.11	31.5	20.42	17.03	31.5	7.81	38.44	31.6	48.94	13.83	31.7	55.82	15.78
13.72	+13.69		50.70	+50.69		11.89	-11.85		12.30	+12.26		11.84	+11.80	
0 ^h 57 ^m	16 ^s .959		1 ^h 30 ^m	42 ^s .307		1 ^h 41 ^m	58 ^s .587		4 ^h 10 ^m	20 ^s .187		5 ^h 35 ^m	31 ^s .554	
+85° 49'	4'' .72		+88° 52'	2'' .06		-85° 11'	3'' .34		+85° 20'	19'' .62		+85° 9'	32'' .39	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensae. Mag. 6.2			C Mensae. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "
	5 45	-84 49		6 46	-80 43		7 2	+87 10		7 14	+82 33		7 15	-86 54
0.8	46.27	27.26	0.8	44.13	31.13	0.8	46.22	27.98	0.9	1.41	62.75	0.9	24.01	6.84
1.8	46.49	27.13	1.8	44.24	30.91	1.8	46.70	27.81	1.9	1.59	62.56	1.9	24.27	6.59
2.8	46.71	26.99	2.8	44.34	30.69	2.8	47.14	27.66	2.9	1.76	62.39	2.9	24.55	6.35
3.8	46.94	26.85	3.8	44.47	30.49	3.8	47.56	27.50	3.8	1.91	62.22	3.9	24.86	6.11
4.8	47.19	26.74	4.8	44.59	30.31	4.8	47.97	27.33	4.8	2.06	62.05	4.8	25.19	5.88
5.8	47.43	26.65	5.8	44.72	30.14	5.8	48.37	27.16	5.8	2.21	61.87	5.8	25.52	5.69
6.8	47.69	26.58	6.8	44.84	29.99	6.8	48.77	26.98	6.8	2.36	61.67	6.8	25.88	5.50
7.8	47.93	26.53	7.8	44.97	29.85	7.8	49.18	26.79	7.8	2.51	61.47	7.8	26.24	5.33
8.8	48.16	26.49	8.8	45.10	29.75	8.8	49.59	26.59	8.8	2.67	61.26	8.8	26.60	5.19
9.8	48.40	26.46	9.8	45.22	29.64	9.8	50.04	26.39	9.8	2.84	61.04	9.8	26.94	5.05
10.8	48.63	26.44	10.8	45.34	29.53	10.8	50.51	26.18	10.8	3.02	60.83	10.8	27.28	4.92
11.8	48.85	26.42	11.8	45.48	29.43	11.8	50.99	26.00	11.8	3.20	60.63	11.8	27.61	4.79
12.8	49.07	26.40	12.8	45.58	29.33	12.8	51.51	25.82	12.8	3.39	60.43	12.8	27.93	4.66
13.8	49.29	26.36	13.8	45.70	29.20	13.8	52.02	25.67	13.8	3.59	60.27	13.8	28.23	4.52
14.8	49.50	26.31	14.8	45.82	29.09	14.8	52.57	25.52	14.8	3.80	60.11	14.8	28.54	4.37
15.8	49.73	26.26	15.8	45.94	28.96	15.8	53.10	25.40	15.8	4.01	59.97	15.8	28.85	4.20
16.8	49.95	26.21	16.8	46.06	28.82	16.8	53.62	25.30	16.8	4.21	59.84	16.8	29.17	4.04
17.8	50.18	26.16	17.8	46.18	28.69	17.8	54.10	25.20	17.8	4.40	59.72	17.8	29.52	3.87
18.7	50.44	26.12	18.8	46.32	28.58	18.8	54.57	25.10	18.8	4.57	59.62	18.8	29.89	3.72
19.7	50.70	26.11	19.8	46.45	28.48	19.8	55.03	24.97	19.8	4.74	59.50	19.8	30.28	3.57
20.7	50.95	26.13	20.8	46.59	28.41	20.8	55.48	24.84	20.8	4.91	59.36	20.8	30.69	3.46
21.7	51.20	26.17	21.8	46.74	28.36	21.8	55.93	24.69	21.8	5.08	59.19	21.8	31.10	3.39
22.7	51.44	26.23	22.8	46.88	28.35	22.8	56.40	24.55	22.8	5.26	59.02	22.8	31.49	3.34
23.7	51.67	26.30	23.8	47.01	28.35	23.8	56.91	24.40	23.8	5.46	58.85	23.8	31.87	3.30
24.7	51.89	26.37	24.8	47.14	28.34	24.8	57.45	24.24	24.8	5.66	58.70	24.8	32.22	3.26
25.7	52.10	26.44	25.8	47.26	28.33	25.8	58.02	24.11	25.8	5.88	58.55	25.8	32.56	3.20
26.7	52.31	26.49	26.8	47.38	28.30	26.8	58.58	24.01	26.8	6.11	58.42	26.8	32.90	3.12
27.7	52.52	26.52	27.8	47.51	28.25	27.8	59.15	23.93	27.8	6.32	58.32	27.8	33.24	3.05
28.7	52.75	26.55	28.8	47.64	28.19	28.8	59.70	23.88	28.8	6.54	58.24	28.8	33.59	2.96
29.7	52.98	26.57	29.8	47.77	28.14	29.8	60.22	23.82	29.8	6.74	58.18	29.8	33.96	2.86
30.7	53.22	26.60	30.8	47.91	28.10	30.8	60.73	23.78	30.8	6.93	58.12	30.8	34.36	2.77
31.7	53.47	26.65	31.8	48.05	28.06	31.8	61.20	23.74	31.8	7.11	58.07	31.8	34.77	2.68
11.08	-11.04		6.20	-6.12		20.28	+20.26		7.73	+7.66		18.50	-18.47	
5 ^h 46 ^m	3°.075		6 ^h 46 ^m	53°.600		7 ^h 2 ^m	33°.206		7 ^h 13 ^m	55°.106		7 ^h 16 ^m	0°.004	
-84° 49'	45''.59		-80° 43'	42''.15		+87° 10'	49''.32		+82° 34'	23''.73		-86° 54'	13''.24	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m 8 16	° ' " s +88 52 26.32	Sept.	h m 9 8	° ' " s -85 20 21.18	Sept.	h m 9 25	° ' " s +81 40 65.02	Sept.	h m 9 36	° ' " s -80 34 35.16	Sept.	h m 10 21	° ' " s +82 58 9.07
0.9	51.48	26.32	0.9	27.61	21.18	0.9	30.50	65.02	0.9	11.91	35.16	0.9	9.07	17.12
1.9	52.39	26.05	1.9	27.67	20.87	1.9	30.59	64.67	1.9	11.93	34.83	1.9	9.12	16.75
2.9	53.26	25.79	2.9	27.75	20.55	2.9	30.68	64.36	2.9	11.96	34.50	2.9	9.18	16.41
3.9	54.10	25.55	3.9	27.84	20.23	3.9	30.76	64.07	3.9	11.99	34.16	3.9	9.23	16.07
4.9	54.89	25.31	4.9	27.94	19.91	4.9	30.82	63.78	4.9	12.03	33.82	4.9	9.27	15.74
5.9	55.65	25.04	5.9	28.07	19.60	5.9	30.88	63.46	5.9	12.07	33.50	5.9	9.30	15.42
6.9	56.41	24.77	6.9	28.22	19.31	6.9	30.94	63.15	6.9	12.13	33.19	6.9	9.33	15.08
7.9	57.17	24.49	7.9	28.36	19.03	7.9	31.00	62.83	7.9	12.19	32.90	7.9	9.35	14.73
8.9	57.96	24.20	8.9	28.51	18.75	8.9	31.07	62.49	8.9	12.25	32.61	8.9	9.38	14.37
9.9	58.78	23.91	9.9	28.66	18.49	9.9	31.15	62.13	9.9	12.31	32.34	9.9	9.41	13.99
10.9	59.67	23.62	10.9	28.81	18.25	10.9	31.23	61.78	10.9	12.37	32.08	10.9	9.45	13.61
11.9	60.62	23.32	11.9	28.95	18.01	11.9	31.31	61.42	11.9	12.44	31.82	11.9	9.51	13.22
12.9	61.63	23.03	12.9	29.09	17.78	12.9	31.41	61.08	12.9	12.50	31.58	12.9	9.58	12.82
13.9	62.69	22.75	13.9	29.22	17.54	13.9	31.52	60.74	13.9	12.56	31.34	13.9	9.66	12.43
14.9	63.79	22.51	14.9	29.35	17.30	14.9	31.65	60.41	14.9	12.61	31.07	14.9	9.74	12.05
15.9	64.91	22.26	15.9	29.47	17.04	15.9	31.77	60.08	15.9	12.67	30.81	15.9	9.84	11.68
16.9	66.01	22.03	16.9	29.60	16.78	16.9	31.88	59.78	16.9	12.72	30.53	16.9	9.94	11.34
17.9	67.07	21.84	17.9	29.73	16.50	17.9	31.99	59.49	17.9	12.78	30.23	17.9	10.03	11.01
18.9	68.07	21.64	18.9	29.90	16.22	18.9	32.10	59.21	18.9	12.84	29.94	18.9	10.11	10.68
19.8	69.02	21.42	19.9	30.07	15.95	19.9	32.20	58.93	19.9	12.91	29.66	19.9	10.17	10.36
20.8	69.95	21.19	20.9	30.26	15.71	20.9	32.28	58.62	20.9	13.01	29.38	20.9	10.23	10.03
21.8	70.87	20.95	21.9	30.47	15.47	21.9	32.37	58.31	21.9	13.10	29.14	21.9	10.31	9.68
22.8	71.84	20.68	22.9	30.69	15.27	22.9	32.46	57.99	22.9	13.19	28.90	22.9	10.38	9.32
23.8	72.86	20.42	23.9	30.90	15.09	23.9	32.57	57.66	23.9	13.29	28.71	23.9	10.45	8.94
24.8	73.96	20.16	24.9	31.10	14.93	24.9	32.69	57.31	24.9	13.39	28.51	24.9	10.53	8.55
25.8	75.14	19.92	25.9	31.28	14.75	25.9	32.82	56.97	25.9	13.48	28.31	25.9	10.63	8.16
26.8	76.38	19.68	26.9	31.45	14.56	26.9	32.96	56.65	26.9	13.57	28.11	26.9	10.76	7.77
27.8	77.63	19.48	27.9	31.62	14.37	27.9	33.11	56.35	27.9	13.65	27.90	27.9	10.88	7.40
28.8	78.85	19.29	28.9	31.80	14.16	28.9	33.25	56.06	28.9	13.72	27.67	28.9	11.01	7.07
29.8	80.04	19.12	29.9	31.97	13.94	29.9	33.38	55.80	29.9	13.81	27.40	29.9	11.13	6.75
30.8	81.19	18.97	30.9	32.17	13.71	30.9	33.52	55.56	30.9	13.90	27.16	30.9	11.24	6.42
31.8	82.28	18.82	31.9	32.40	13.49	31.9	33.63	55.32	31.9	13.98	26.91	31.9	11.35	6.13
50.84	+50.83	12.30	-12.26	6.91	+6.84	6.11	-6.02	8.17	+8.11					
8 ^h 16 ^m 48 ^s .125	9 ^h 8 ^m 49 ^s .775	9 ^h 25 ^m 30 ^s .501	9 ^h 36 ^m 20 ^s .688	10 ^h 21 ^m 12 ^s .394										
+88° 52' 49".08	-85° 20' 12".12	+81° 41' 25".82	-80° 34' 23".04	+82° 58' 35".87										

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "
	10 59	-84 9		12 13	+88 8		12 46	-84 41		12 48	+83 51		13 27	-85 22
	s	"		s	"		s	"		s	"		s	"
1.0	43.15	32.07	1.1	51.16	64.59	1.1	9.03	11.85	1.1	20.78	22.87	1.1	23.15	32.18
2.0	43.11	31.76	2.1	50.98	64.24	2.1	8.89	11.62	2.1	20.70	22.54	2.1	22.96	31.98
3.0	43.06	31.42	3.1	50.81	63.90	3.1	8.75	11.36	3.1	20.62	22.22	3.1	22.75	31.75
4.0	43.03	31.08	4.1	50.63	63.56	4.1	8.61	11.06	4.1	20.53	21.90	4.1	22.56	31.50
5.0	43.02	30.76	5.1	50.41	63.23	5.1	8.47	10.77	5.1	20.44	21.59	5.1	22.37	31.23
5.9	43.01	30.42	6.0	50.18	62.91	6.1	8.36	10.46	6.1	20.34	21.29	6.1	22.19	30.97
6.9	43.02	30.08	7.0	49.93	62.59	7.1	8.26	10.15	7.1	20.24	20.99	7.1	22.02	30.70
7.9	43.04	29.76	8.0	49.66	62.25	8.1	8.17	9.85	8.1	20.14	20.69	8.1	21.88	30.42
8.9	43.07	29.44	9.0	49.40	61.90	9.1	8.09	9.55	9.1	20.03	20.38	9.1	21.76	30.14
9.9	43.10	29.13	10.0	49.14	61.53	10.1	8.03	9.27	10.1	19.92	20.04	10.1	21.63	29.87
10.9	43.13	28.82	11.0	48.90	61.16	11.1	7.98	8.99	11.1	19.81	19.69	11.1	21.53	29.60
11.9	43.16	28.54	12.0	48.68	60.75	12.1	7.92	8.72	12.1	19.72	19.33	12.1	21.43	29.36
12.9	43.19	28.27	13.0	48.49	60.36	13.1	7.85	8.45	13.1	19.63	18.95	13.1	21.31	29.12
13.9	43.21	27.99	14.0	48.35	59.96	14.0	7.77	8.19	14.1	19.55	18.56	14.1	21.19	28.88
14.9	43.22	27.71	15.0	48.25	59.55	15.0	7.70	7.93	15.0	19.50	18.17	15.1	21.07	28.65
15.9	43.23	27.43	16.0	48.20	59.16	16.0	7.62	7.67	16.0	19.44	17.78	16.1	20.93	28.42
16.9	43.24	27.12	17.0	48.17	58.78	17.0	7.54	7.40	17.0	19.40	17.40	17.1	20.78	28.17
17.9	43.27	26.81	18.0	48.15	58.40	18.0	7.45	7.09	18.0	19.36	17.04	18.1	20.64	27.89
18.9	43.30	26.48	19.0	48.10	58.04	19.0	7.36	6.76	19.0	19.31	16.71	19.1	20.50	27.59
19.9	43.34	26.14	20.0	48.01	57.69	20.0	7.30	6.43	20.0	19.26	16.36	20.1	20.37	27.28
20.9	43.40	25.81	21.0	47.88	57.34	21.0	7.26	6.08	21.0	19.18	16.03	21.1	20.28	26.96
21.9	43.48	25.48	22.0	47.72	56.99	22.0	7.25	5.75	22.0	19.11	15.69	22.1	20.21	26.64
22.9	43.57	25.19	23.0	47.57	56.60	23.0	7.24	5.44	23.0	19.03	15.32	23.1	20.16	26.31
23.9	43.67	24.91	24.0	47.43	56.20	24.0	7.24	5.15	24.0	18.95	14.95	24.1	20.12	26.03
24.9	43.76	24.64	24.9	47.32	55.78	25.0	7.24	4.87	25.0	18.89	14.54	25.0	20.08	25.77
25.9	43.84	24.38	25.9	47.26	55.36	26.0	7.24	4.60	26.0	18.84	14.12	26.0	20.04	25.52
26.9	43.92	24.14	26.9	47.25	54.94	27.0	7.22	4.33	27.0	18.81	13.70	27.0	19.98	25.26
27.9	43.97	23.88	27.9	47.29	54.51	28.0	7.19	4.06	28.0	18.79	13.29	28.0	19.90	24.99
28.9	44.03	23.61	28.9	47.37	54.10	29.0	7.16	3.76	29.0	18.78	12.90	29.0	19.82	24.71
29.9	44.09	23.31	29.9	47.45	53.73	30.0	7.13	3.44	30.0	18.78	12.52	30.0	19.73	24.40
30.9	44.17	23.00	30.9	47.54	53.36	31.0	7.10	3.11	31.0	18.78	12.16	31.0	19.64	24.09
31.9	44.24	22.68	31.9	47.60	53.00	32.0	7.08	2.77	32.0	18.75	11.79	32.0	19.57	23.77
9.82	-9.77		30.97	+30.96		10.80	-10.75		9.34	+9.29		12.40	-12.36	
10 ^h 59 ^m	54 ^s .915		12 ^h 14 ^m	28 ^s .804		12 ^h 46 ^m	13 ^s .131		12 ^h 48 ^m	30 ^s .862		13 ^h 27 ^m	23 ^s .749	
-84° 9'	9'' .97		+88° 9'	16'' .14		-84° 40'	41'' .95		+83° 51'	30'' .88		-85° 22'	0'' .86	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m	s	Sept.	h m	s	Sept.	h m	s	Sept.	h m	s	Sept.	h m	s
	14 13	-83 18		15 2	+87 32		15 24	-84 12		16 54	+82 10		17 16	-80 47
1.1	41.29	8.98	1.2	49.78	61.35	1.2	20.82	12.07	1.3	13.72	42.41	1.3	19.27	30.10
2.1	41.14	8.83	2.2	49.30	61.16	2.2	20.62	12.00	2.3	13.54	42.38	2.3	19.15	30.19
3.1	40.98	8.65	3.2	48.84	60.97	3.2	20.41	11.92	3.3	13.37	42.35	3.3	19.02	30.27
4.1	40.81	8.47	4.2	48.39	60.78	4.2	20.19	11.82	4.3	13.20	42.34	4.3	18.88	30.32
5.1	40.67	8.28	5.2	47.93	60.59	5.2	19.98	11.70	5.2	13.03	42.33	5.3	18.74	30.36
6.1	40.52	8.05	6.2	47.46	60.42	6.2	19.77	11.56	6.2	12.86	42.33	6.3	18.60	30.38
7.1	40.38	7.81	7.2	46.97	60.26	7.2	19.58	11.40	7.2	12.69	42.34	7.3	18.46	30.39
8.1	40.25	7.58	8.2	46.47	60.10	8.2	19.39	11.23	8.2	12.52	42.35	8.3	18.33	30.39
9.1	40.12	7.35	9.2	45.97	59.93	9.2	19.21	11.09	9.2	12.34	42.36	9.3	18.20	30.35
10.1	40.02	7.10	10.2	45.44	59.75	10.2	19.04	10.93	10.2	12.15	42.36	10.2	18.07	30.32
11.1	39.92	6.87	11.2	44.91	59.56	11.2	18.89	10.78	11.2	11.96	42.33	11.2	17.97	30.29
12.1	39.82	6.65	12.2	44.39	59.34	12.2	18.74	10.64	12.2	11.77	42.31	12.2	17.86	30.28
13.1	39.72	6.45	13.1	43.87	59.11	13.2	18.59	10.50	13.2	11.59	42.26	13.2	17.75	30.28
14.1	39.62	6.25	14.1	43.36	58.84	14.2	18.42	10.36	14.2	11.40	42.18	14.2	17.65	30.28
15.1	39.50	6.06	15.1	42.89	58.57	15.2	18.26	10.25	15.2	11.21	42.08	15.2	17.53	30.29
16.1	39.38	5.85	16.1	42.44	58.30	16.2	18.10	10.12	16.2	11.03	41.98	16.2	17.41	30.30
17.1	39.27	5.64	17.1	42.02	58.03	17.2	17.91	9.99	17.2	10.86	41.87	17.2	17.29	30.31
18.1	39.13	5.42	18.1	41.61	57.77	18.1	17.73	9.82	18.2	10.69	41.76	18.2	17.16	30.31
19.1	39.01	5.16	19.1	41.21	57.53	19.1	17.54	9.64	19.2	10.52	41.67	19.2	17.01	30.28
20.1	38.89	4.89	20.1	40.80	57.31	20.1	17.36	9.44	20.2	10.35	41.60	20.2	16.87	30.23
21.1	38.79	4.59	21.1	40.36	57.08	21.1	17.19	9.22	21.2	10.17	41.56	21.2	16.74	30.14
22.1	38.70	4.28	22.1	39.90	56.87	22.1	17.04	8.98	22.2	9.99	41.51	22.2	16.61	30.05
23.1	38.64	3.99	23.1	39.42	56.64	23.1	16.90	8.73	23.2	9.82	41.46	23.2	16.49	29.95
24.1	38.59	3.72	24.1	38.92	56.40	24.1	16.79	8.52	24.2	9.63	41.38	24.2	16.39	29.83
25.1	38.53	3.45	25.1	38.42	56.13	25.1	16.67	8.33	25.2	9.43	41.28	25.2	16.29	29.74
26.1	38.48	3.22	26.1	37.95	55.83	26.1	16.55	8.14	26.2	9.25	41.15	26.2	16.19	29.66
27.1	38.40	2.98	27.1	37.51	55.52	27.1	16.43	7.95	27.2	9.07	41.01	27.2	16.09	29.58
28.1	38.32	2.75	28.1	37.11	55.20	28.1	16.30	7.77	28.2	8.89	40.84	28.2	15.99	29.53
29.1	38.24	2.51	29.1	36.74	54.87	29.1	16.16	7.58	29.2	8.71	40.68	29.2	15.86	29.47
30.1	38.15	2.25	30.1	36.40	54.58	30.1	15.99	7.37	30.2	8.56	40.53	30.2	15.74	29.41
31.1	38.05	1.98	31.1	36.06	54.29	31.1	15.83	7.14	31.2	8.41	40.38	31.2	15.60	29.33
32.1	37.96	1.66	32.1	35.73	54.00	32.1	15.68	6.88	32.2	8.24	40.23	32.2	15.47	29.23
8.57	-8.51		23.39	+23.37		9.90	-9.85		7.35	+7.28		6.25	-6.17	
14 ^h 13 ^m 37 ^s .066			15 ^h 3 ^m 21 ^s .809			15 ^h 24 ^m 9 ^s .966			16 ^h 54 ^m 19 ^s .238			17 ^h 16 ^m 6 ^s .064		
-83° 17' 37".78			+87° 32' 56".60			-84° 11' 42".92			+82° 10' 27".09			-80° 47' 10".43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Sept.	17 58	+86 37	Sept.	18 7	-87 40	Sept.	19 0	+89 1	Sept.	19 31	-89 13	Sept.	20 48	+82 14
	s	"		s	"		s	"		s	"		s	"
1.3	30.07	10.44	1.3	37.25	6.33	1.3	60.68	29.42	1.4	57.14	24.99	1.4	41.02	7.18
2.3	29.67	10.50	2.3	36.80	6.49	2.3	59.38	29.57	2.4	56.17	25.26	2.4	40.92	7.46
3.3	29.28	10.56	3.3	36.33	6.64	3.3	58.13	29.72	3.4	55.08	25.51	3.4	40.82	7.76
4.3	28.89	10.64	4.3	35.81	6.79	4.3	56.92	29.88	4.4	53.90	25.74	4.4	40.72	8.04
5.3	28.52	10.73	5.3	35.29	6.90	5.3	55.75	30.05	5.4	52.65	25.97	5.4	40.63	8.34
6.3	28.15	10.82	6.3	34.76	7.00	6.3	54.59	30.23	6.4	51.33	26.17	6.4	40.54	8.63
7.3	27.77	10.91	7.3	34.23	7.11	7.3	53.42	30.42	7.3	49.98	26.36	7.4	40.45	8.95
8.3	27.38	11.01	8.3	33.70	7.15	8.3	52.22	30.61	8.3	48.63	26.54	8.4	40.36	9.26
9.3	26.97	11.12	9.3	33.19	7.21	9.3	50.98	30.80	9.3	47.30	26.70	9.4	40.27	9.58
10.3	26.55	11.24	10.3	32.71	7.25	10.3	49.68	31.01	10.3	46.02	26.87	10.4	40.17	9.92
11.3	26.12	11.34	11.3	32.24	7.29	11.3	48.32	31.21	11.3	44.78	27.01	11.4	40.07	10.25
12.3	25.67	11.42	12.3	31.78	7.33	12.3	46.90	31.39	12.3	43.59	27.15	12.4	39.94	10.58
13.3	25.22	11.48	13.3	31.35	7.41	13.3	45.43	31.56	13.3	42.46	27.32	13.4	39.82	10.90
14.3	24.77	11.52	14.3	30.93	7.48	14.3	43.93	31.70	14.3	41.34	27.48	14.4	39.70	11.20
15.3	24.31	11.54	15.3	30.49	7.55	15.3	42.39	31.84	15.3	40.23	27.65	15.4	39.57	11.49
16.3	23.87	11.55	16.3	30.02	7.62	16.3	40.90	31.95	16.3	39.05	27.82	16.4	39.43	11.77
17.3	23.45	11.55	17.3	29.52	7.70	17.3	39.45	32.05	17.3	37.79	28.00	17.4	39.30	12.01
18.3	23.03	11.54	18.3	28.99	7.78	18.3	38.08	32.14	18.3	36.43	28.18	18.4	39.17	12.25
19.3	22.64	11.54	19.3	28.43	7.83	19.3	36.75	32.24	19.3	34.97	28.35	19.4	39.05	12.49
20.3	22.25	11.57	20.3	27.87	7.84	20.3	35.45	32.37	20.3	33.42	28.49	20.4	38.93	12.75
21.2	21.84	11.61	21.3	27.31	7.85	21.3	34.15	32.50	21.3	31.84	28.60	21.4	38.81	13.01
22.2	21.43	11.67	22.3	26.78	7.81	22.3	32.80	32.65	22.3	30.28	28.69	22.4	38.70	13.29
23.2	21.00	11.73	23.2	26.27	7.77	23.3	31.39	32.80	23.3	28.80	28.76	23.4	38.59	13.61
24.2	20.54	11.77	24.2	25.80	7.73	24.3	29.91	32.96	24.3	27.39	28.83	24.4	38.46	13.91
25.2	20.07	11.79	25.2	25.37	7.69	25.3	28.34	33.10	25.3	26.07	28.90	25.4	38.32	14.20
26.2	19.60	11.79	26.2	24.94	7.66	26.3	26.74	33.20	26.3	24.80	28.98	26.4	38.17	14.49
27.2	19.13	11.76	27.2	24.49	7.65	27.3	25.12	33.29	27.3	23.54	29.07	27.4	38.02	14.76
28.2	18.67	11.71	28.2	24.03	7.66	28.3	23.53	33.35	28.3	22.24	29.18	28.3	37.87	14.99
29.2	18.24	11.65	29.2	23.54	7.68	29.3	21.99	33.40	29.3	20.86	29.30	29.3	37.71	15.19
30.2	17.82	11.58	30.2	23.02	7.69	30.3	20.50	33.44	30.3	19.38	29.41	30.3	37.56	15.39
31.2	17.41	11.52	31.2	22.47	7.67	31.3	19.08	33.48	31.3	17.80	29.52	31.3	37.41	15.59
32.2	17.03	11.46	32.2	21.90	7.64	32.3	17.71	33.52	32.3	16.15	29.62	32.3	37.27	15.78
16.96	+16.93		24.58	-24.56		58.80	+58.79		73.87	-73.86		7.40	+7.34	
17 ^h 58 ^m 41 ^s .809			18 ^h 6 ^m 47 ^s .620			19 ^h 1 ^m 27 ^s .463			19 ^h 29 ^m 16 ^s .746			20 ^h 48 ^m 36 ^s .323		
86° 36' 51".12			-87° 39' 51".38			+89° 1' 7".53			-89° 13' 21".02			+82° 13' 43".34		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "
	21 38	-83 5		22 16	-86 22		22 37	-81 48		23 28	+86 51		23 47	-82 28
1.5	48.41	36.27	1.5	52.21	50.40	1.5	60.06	21.99	1.5	7.65	34.88	1.5	32.12	0.52
2.5	48.39	36.58	2.5	52.23	50.71	2.5	60.08	22.30	2.5	7.68	35.26	2.5	32.19	0.80
3.5	48.36	36.90	3.5	52.24	51.05	3.5	60.10	22.63	3.5	7.70	35.62	3.5	32.26	1.10
4.4	48.32	37.22	4.5	52.21	51.38	4.5	60.11	22.96	4.5	7.73	35.97	4.5	32.32	1.41
5.4	48.27	37.55	5.5	52.17	51.72	5.5	60.10	23.30	5.5	7.78	36.32	5.5	32.37	1.74
6.4	48.21	37.86	6.5	52.09	52.05	6.5	60.08	23.63	6.5	7.84	36.66	6.5	32.40	2.06
7.4	48.13	38.16	7.5	52.01	52.38	7.5	60.06	23.94	7.5	7.91	37.01	7.5	32.43	2.38
8.4	48.05	38.44	8.5	51.92	52.69	8.5	60.03	24.25	8.5	7.99	37.37	8.5	32.45	2.70
9.4	47.98	38.71	9.5	51.82	52.98	9.5	60.00	24.55	9.5	8.06	37.74	9.5	32.47	3.01
10.4	47.91	38.97	10.5	51.73	53.27	10.5	59.98	24.85	10.5	8.12	38.11	10.5	32.48	3.31
11.4	47.85	39.22	11.5	51.64	53.55	11.5	59.95	25.13	11.5	8.18	38.51	11.5	32.50	3.60
12.4	47.79	39.47	12.5	51.56	53.82	12.5	59.93	25.40	12.5	8.22	38.92	12.5	32.52	3.87
13.4	47.73	39.70	13.4	51.49	54.09	13.5	59.92	25.66	13.5	8.23	39.33	13.5	32.55	4.14
14.4	47.68	39.96	14.4	51.43	54.37	14.5	59.91	25.92	14.5	8.21	39.75	14.5	32.58	4.41
15.4	47.63	40.23	15.4	51.38	54.65	15.5	59.91	26.20	15.5	8.18	40.17	15.5	32.62	4.69
16.4	47.58	40.52	16.4	51.32	54.94	16.5	59.90	26.51	16.5	8.12	40.56	16.5	32.67	4.98
17.4	47.52	40.81	17.4	51.25	55.25	17.5	59.89	26.82	17.5	8.06	40.95	17.5	32.70	5.29
18.4	47.44	41.10	18.4	51.15	55.56	18.5	59.86	27.15	18.5	8.00	41.32	18.5	32.72	5.61
19.4	47.34	41.39	19.4	51.03	55.88	19.4	59.82	27.47	19.5	7.95	41.68	19.5	32.73	5.95
20.4	47.24	41.69	20.4	50.88	56.20	20.4	59.77	27.79	20.5	7.93	42.03	20.5	32.72	6.29
21.4	47.12	41.95	21.4	50.71	56.50	21.4	59.71	28.09	21.5	7.93	42.39	21.5	32.70	6.62
22.4	47.00	42.19	22.4	50.52	56.76	22.4	59.65	28.37	22.5	7.94	42.76	22.5	32.67	6.94
23.4	46.88	42.41	23.4	50.34	57.01	23.4	59.58	28.64	23.5	7.94	43.16	23.5	32.64	7.23
24.4	46.78	42.61	24.4	50.17	57.24	24.4	59.52	28.89	24.5	7.92	43.57	24.5	32.61	7.51
25.4	46.69	42.80	25.4	50.01	57.47	25.4	59.47	29.13	25.5	7.89	43.99	25.5	32.60	7.78
26.4	46.60	43.01	26.4	49.87	57.71	26.4	59.42	29.37	26.5	7.83	44.40	26.5	32.60	8.05
27.4	46.51	43.23	27.4	49.74	57.97	27.4	59.38	29.62	27.5	7.74	44.82	27.5	32.60	8.33
28.4	46.43	43.45	28.4	49.62	58.24	28.4	59.34	29.89	28.5	7.62	45.22	28.5	32.60	8.63
29.4	46.34	43.70	29.4	49.48	58.52	29.4	59.29	30.18	29.5	7.49	45.60	29.5	32.59	8.93
30.4	46.23	43.97	30.4	49.32	58.81	30.4	59.24	30.48	30.5	7.35	45.97	30.5	32.57	9.25
31.4	46.11	44.23	31.4	49.15	59.10	31.4	59.17	30.78	31.4	7.22	46.31	31.5	32.55	9.58
32.4	45.98	44.48	32.4	48.95	59.39	32.4	59.09	31.09	32.4	7.11	46.65	32.5	32.52	9.92
8.32	-8.26		15.85	-15.81		7.02	-6.95		18.26	+18.23		7.63	-7.56	
21 ^h 38 ^m	29 ^s .050		22 ^h 16 ^m	20 ^s .949		22 ^h 37 ^m	45 ^s .323		23 ^h 27 ^m	43 ^s .851		23 ^h 47 ^m	20 ^s .032	
-83° 5'	50''.66		-86° 23'	9''.03		-81° 48'	43''.57		+86° 51'	18''.76		-82° 28'	28''.42	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '
	0 57	+85 49		1 32	+88 52		1 42	-85 10		4 10	+85 20		5 35	+85 9
	s	"		s	"		s	"		s	"		s	"
0.5	43.64	23.75	0.5	20.12	16.09	0.5	7.72	38.12	0.6	48.70	13.63	0.7	55.55	15.70
1.5	43.67	24.11	1.5	20.42	17.03	1.5	7.81	38.44	1.6	48.94	13.83	1.7	55.82	15.78
2.5	43.70	24.45	2.5	20.73	17.37	2.5	7.90	38.76	2.6	49.18	14.03	2.7	56.09	15.86
3.5	43.75	24.78	3.5	21.07	17.70	3.5	7.96	39.10	3.6	49.42	14.22	3.7	56.36	15.93
4.5	43.80	25.12	4.5	21.44	18.04	4.5	8.02	39.46	4.6	49.66	14.41	4.7	56.63	16.00
5.5	43.86	25.48	5.5	21.84	18.37	5.5	8.06	39.81	5.6	49.90	14.58	5.7	56.90	16.06
6.5	43.93	25.84	6.5	22.26	18.73	6.5	8.08	40.15	6.6	50.17	14.76	6.7	57.19	16.13
7.5	43.99	26.21	7.5	22.68	19.09	7.5	8.10	40.49	7.6	50.44	14.97	7.7	57.49	16.19
8.5	44.06	26.58	8.5	23.09	19.45	8.5	8.12	40.81	8.6	50.72	15.19	8.7	57.80	16.26
9.5	44.12	26.99	9.5	23.48	19.83	9.5	8.13	41.13	9.6	51.00	15.41	9.7	58.12	16.34
10.5	44.17	27.39	10.5	23.82	20.23	10.5	8.15	41.42	10.6	51.28	15.64	10.7	58.45	16.45
11.5	44.19	27.80	11.5	24.09	20.64	11.5	8.18	41.71	11.6	51.55	15.91	11.7	58.78	16.58
12.5	44.20	28.21	12.5	24.31	21.04	12.5	8.21	41.99	12.6	51.81	16.19	12.7	59.09	16.73
13.5	44.18	28.60	13.5	24.44	21.45	13.5	8.25	42.28	13.6	52.06	16.47	13.7	59.38	16.89
14.5	44.15	28.99	14.5	24.52	21.84	14.5	8.29	42.58	14.6	52.28	16.75	14.7	59.67	17.06
15.5	44.12	29.37	15.5	24.57	22.22	15.5	8.33	42.90	15.6	52.48	17.03	15.7	59.94	17.22
16.5	44.09	29.73	16.5	24.65	22.59	16.5	8.34	43.23	16.6	52.68	17.29	16.7	60.20	17.37
17.5	44.07	30.07	17.5	24.75	22.94	17.5	8.34	43.59	17.6	52.88	17.54	17.7	60.45	17.51
18.5	44.06	30.41	18.5	24.91	23.28	18.5	8.31	43.95	18.6	53.10	17.78	18.7	60.71	17.62
19.5	44.08	30.77	19.5	25.13	23.63	19.5	8.28	44.30	19.6	53.33	18.00	19.7	60.98	17.73
20.5	44.10	31.13	20.5	25.37	23.99	20.5	8.23	44.64	20.6	53.58	18.23	20.7	61.26	17.84
21.5	44.12	31.51	21.5	25.63	24.37	21.5	8.18	44.96	21.6	53.84	18.46	21.6	61.57	17.96
22.5	44.13	31.90	22.5	25.85	24.77	22.5	8.12	45.26	22.6	54.09	18.73	22.6	61.89	18.10
23.5	44.13	32.31	23.5	26.00	25.18	23.5	8.07	45.55	23.6	54.34	19.01	23.6	62.20	18.27
24.4	44.09	32.72	24.5	26.06	25.60	24.5	8.03	45.83	24.6	54.58	19.33	24.6	62.50	18.47
25.4	44.04	33.13	25.5	26.02	26.03	25.5	7.99	46.12	25.6	54.81	19.65	25.6	62.79	18.67
26.4	43.97	33.52	26.5	25.92	26.43	26.5	7.97	46.42	26.6	55.01	19.98	26.6	63.07	18.89
27.4	43.87	33.88	27.5	25.77	26.81	27.5	7.95	46.73	27.6	55.19	20.30	27.6	63.32	19.11
28.4	43.79	34.22	28.5	25.61	27.17	28.5	7.91	47.05	28.6	55.34	20.60	28.6	63.55	19.33
29.4	43.70	34.55	29.5	25.45	27.51	29.5	7.87	47.38	29.6	55.49	20.89	29.6	63.78	19.53
30.4	43.61	34.88	30.5	25.31	27.85	30.5	7.82	47.73	30.6	55.64	21.17	30.6	64.00	19.71
31.4	43.54	35.20	31.5	25.21	28.19	31.5	7.74	48.09	31.6	55.81	21.45	31.6	64.23	19.88
13.74	+13.70		50.83	+50.82		11.90	-11.86		12.30	+12.26		11.84	+11.80	
0 ^h 57 ^m 16 ^s .959			1 ^h 30 ^m 42 ^s .307			1 ^h 41 ^m 58 ^s .587			4 ^h 10 ^m 20 ^s .187			5 ^h 35 ^m 31 ^s .554		
+85° 49' 4''.72			+88° 52' 2''.06			-85° 11' 3''.34			+85° 20' 19''.62			+85° 9' 32''.39		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensse. Mag. 6.2			C Mensse. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Ootantis. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Oct.	h m ° ' "		Oct.	h m ° ' "		Oct.	h m ° ' "		Oct.	h m ° ' "		Oct.	h m ° ' "	
	5 45 -84 49			6 46 -80 43			7 3 +87 10			7 14 +82 33			7 15 -86 54	
	s "			s "			s "			s "			s "	
0.7	53.22 26.60	0.8	47.91 28.10	0.8	0.73 23.78	0.8	6.93 58.12	0.8	34.36 2.77					
1.7	53.47 26.65	1.8	48.05 28.06	1.8	1.20 23.74	1.8	7.11 58.07	1.8	34.77 2.68					
2.7	53.72 26.73	2.8	48.19 28.06	2.8	1.68 23.70	2.8	7.29 58.00	2.8	35.19 2.63					
3.7	53.97 26.82	3.7	48.33 28.06	3.8	2.14 23.64	3.8	7.47 57.92	3.8	35.63 2.59					
4.7	54.22 26.93	4.7	48.48 28.08	4.8	2.60 23.57	4.8	7.64 57.84	4.8	36.06 2.57					
5.7	54.47 27.06	5.7	48.63 28.13	5.8	3.08 23.49	5.8	7.82 57.74	5.8	36.50 2.56					
6.7	54.70 27.21	6.7	48.78 28.19	6.8	3.57 23.41	6.8	8.01 57.63	6.8	36.93 2.57					
7.7	54.93 27.35	7.7	48.91 28.25	7.7	4.07 23.34	7.8	8.20 57.53	7.8	37.34 2.60					
8.7	55.15 27.50	8.7	49.05 28.32	8.7	4.59 23.28	8.8	8.40 57.42	8.8	37.74 2.64					
9.7	55.35 27.65	9.7	49.19 28.39	9.7	5.15 23.23	9.8	8.62 57.34	9.8	38.12 2.68					
10.7	55.55 27.79	10.7	49.32 28.45	10.7	5.72 23.17	10.7	8.84 57.29	10.8	38.49 2.70					
11.7	55.76 27.93	11.7	49.45 28.51	11.7	6.29 23.14	11.7	9.07 57.25	11.7	38.86 2.72					
12.7	55.96 28.05	12.7	49.58 28.56	12.7	6.86 23.13	12.7	9.29 57.21	12.7	39.22 2.72					
13.7	56.18 28.16	13.7	49.70 28.60	13.7	7.41 23.16	13.7	9.51 57.21	13.7	39.59 2.70					
14.7	56.39 28.28	14.7	49.84 28.64	14.7	7.95 23.19	14.7	9.71 57.20	14.7	39.97 2.69					
15.7	56.61 28.40	15.7	49.97 28.69	15.7	8.46 23.22	15.7	9.90 57.21	15.7	40.38 2.69					
16.7	56.84 28.54	16.7	50.11 28.77	16.7	8.95 23.23	16.7	10.10 57.21	16.7	40.79 2.73					
17.7	57.07 28.71	17.7	50.25 28.86	17.7	9.41 23.24	17.7	10.28 57.19	17.7	41.22 2.78					
18.7	57.29 28.92	18.7	50.39 28.99	18.7	9.88 23.23	18.7	10.46 57.16	18.7	41.66 2.86					
19.7	57.49 29.14	19.7	50.54 29.14	19.7	10.37 23.21	19.7	10.64 57.12	19.7	42.08 2.96					
20.7	57.69 29.37	20.7	50.67 29.31	20.7	10.87 23.18	20.7	10.84 57.07	20.7	42.50 3.09					
21.7	57.88 29.61	21.7	50.80 29.49	21.7	11.41 23.15	21.7	11.06 57.02	21.7	42.87 3.22					
22.7	58.06 29.84	22.7	50.92 29.64	22.7	11.99 23.14	22.7	11.28 56.98	22.7	43.24 3.35					
23.7	58.22 30.04	23.7	51.04 29.78	23.7	12.56 23.16	23.7	11.51 56.97	23.7	43.58 3.45					
24.6	58.39 30.24	24.7	51.16 29.92	24.7	13.15 23.20	24.7	11.73 56.99	24.7	43.91 3.55					
25.6	58.56 30.43	25.7	51.28 30.05	25.7	13.71 23.28	25.7	11.96 57.03	25.7	44.27 3.63					
26.6	58.74 30.61	26.7	51.39 30.16	26.7	14.24 23.36	26.7	12.16 57.08	26.7	44.63 3.71					
27.6	58.93 30.80	27.7	51.52 30.28	27.7	14.76 23.45	27.7	12.36 57.15	27.7	45.00 3.79					
28.6	59.12 31.02	28.7	51.65 30.42	28.7	15.23 23.55	28.7	12.55 57.22	28.7	45.40 3.87					
29.6	59.32 31.24	29.7	51.78 30.58	29.7	15.70 23.62	29.7	12.73 57.28	29.7	45.81 3.98					
30.6	59.52 31.48	30.7	51.91 30.75	30.7	16.15 23.70	30.7	12.91 57.33	30.7	46.22 4.11					
31.6	59.71 31.75	31.7	52.04 30.95	31.7	16.59 23.76	31.7	13.09 57.39	31.7	46.63 4.25					
11.09	-11.04		6.20 -6.12		20.28 +20.25		7.73 +7.66		18.50 -18.47					
5 ^h 46 ^m 3 ^s .075			6 ^h 46 ^m 53 ^s .600		7 ^h 2 ^m 33 ^s .206		7 ^h 13 ^m 55 ^s .106		7 ^h 16 ^m 0 ^s .004					
-84° 49' 45".59			-80° 43' 42".15		+87° 10' 49".32		+82° 34' 23".73		-86° 54' 13".24					

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamaleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "
Oct. 8 17	+88 52		Oct. 9 8	-85 20		Oct. 9 25	+81 40		Oct. 9 36	-80 34		Oct. 10 21	+82 57	
	s	"		s	"		s	"		s	"		s	"
0.8	21.19	18.97	0.9	32.17	13.71	0.9	33.52	55.56	0.9	13.90	27.16	0.9	11.24	66.42
1.8	22.28	18.82	1.9	32.40	13.49	1.9	33.63	55.32	1.9	13.98	26.91	1.9	11.35	66.13
2.8	23.35	18.65	2.8	32.62	13.26	2.9	33.74	55.08	2.9	14.08	26.66	2.9	11.45	65.84
3.8	24.38	18.49	3.8	32.86	13.06	3.9	33.85	54.84	3.9	14.19	26.43	3.9	11.54	65.55
4.8	25.41	18.32	4.8	33.11	12.87	4.9	33.97	54.58	4.9	14.30	26.22	4.9	11.63	65.24
5.8	26.46	18.14	5.8	33.36	12.71	5.9	34.08	54.32	5.9	14.43	26.03	5.9	11.73	64.92
6.8	27.53	17.95	6.8	33.61	12.56	6.9	34.21	54.05	6.9	14.55	25.84	6.9	11.83	64.60
7.8	28.65	17.76	7.8	33.87	12.43	7.8	34.33	53.76	7.9	14.67	25.67	7.9	11.93	64.26
8.8	29.82	17.57	8.8	34.12	12.32	8.8	34.47	53.47	8.9	14.80	25.53	8.9	12.06	63.92
9.8	31.05	17.38	9.8	34.35	12.21	9.8	34.61	53.19	9.8	14.90	25.39	9.9	12.18	63.58
10.8	32.33	17.21	10.8	34.58	12.11	10.8	34.76	52.90	10.8	15.01	25.25	10.9	12.32	63.24
11.8	33.65	17.06	11.8	34.80	11.99	11.8	34.93	52.63	11.8	15.12	25.11	11.9	12.47	62.90
12.8	34.98	16.93	12.8	35.02	11.86	12.8	35.09	52.40	12.8	15.23	24.96	12.9	12.63	62.58
13.8	36.30	16.82	13.8	35.24	11.72	13.8	35.26	52.17	13.8	15.33	24.80	13.9	12.79	62.29
14.8	37.59	16.72	14.8	35.47	11.57	14.8	35.41	51.96	14.8	15.44	24.62	14.9	12.93	62.01
15.8	38.82	16.63	15.8	35.71	11.43	15.8	35.56	51.76	15.8	15.55	24.45	15.9	13.09	61.74
16.8	40.00	16.54	16.8	35.97	11.29	16.8	35.70	51.57	16.8	15.68	24.28	16.9	13.22	61.49
17.8	41.12	16.43	17.8	36.24	11.18	17.8	35.84	51.38	17.8	15.81	24.14	17.9	13.36	61.22
18.8	42.24	16.30	18.8	36.51	11.07	18.8	35.97	51.16	18.8	15.94	24.02	18.9	13.48	60.95
19.8	43.38	16.17	19.8	36.80	11.01	19.8	36.11	50.94	19.8	16.08	23.91	19.9	13.60	60.67
20.8	44.55	16.03	20.8	37.09	10.96	20.8	36.24	50.70	20.8	16.22	23.83	20.9	13.73	60.35
21.8	45.80	15.88	21.8	37.37	10.92	21.8	36.40	50.45	21.8	16.36	23.77	21.8	13.87	60.02
22.8	47.13	15.74	22.8	37.64	10.89	22.8	36.56	50.20	22.8	16.50	23.72	22.8	14.03	59.70
23.8	48.51	15.63	23.8	37.87	10.88	23.8	36.74	49.96	23.8	16.63	23.67	23.8	14.21	59.39
24.8	49.90	15.53	24.8	38.12	10.85	24.8	36.93	49.74	24.8	16.75	23.62	24.8	14.38	59.10
25.8	51.30	15.48	25.8	38.36	10.80	25.8	37.11	49.54	25.8	16.87	23.53	25.8	14.57	58.83
26.7	52.66	15.44	26.8	38.60	10.72	26.8	37.29	49.37	26.8	16.99	23.45	26.8	14.75	58.58
27.7	53.94	15.40	27.8	38.86	10.65	27.8	37.46	49.23	27.8	17.12	23.35	27.8	14.93	58.36
28.7	55.18	15.38	28.8	39.12	10.59	28.8	37.61	49.10	28.8	17.24	23.25	28.8	15.09	58.14
29.7	56.36	15.35	29.8	39.39	10.54	29.8	37.76	48.96	29.8	17.38	23.17	29.8	15.25	57.92
30.7	57.53	15.32	30.8	39.68	10.51	30.8	37.91	48.81	30.8	17.51	23.09	30.8	15.39	57.72
31.7	58.65	15.28	31.8	39.98	10.49	31.8	38.05	48.68	31.8	17.66	23.03	31.8	15.54	57.50
50.77	+50.76		12.30	-12.26		6.91	+6.84		6.11	-6.02		8.17	+8.11	
8 ^h 16 ^m 48 ^s .125			9 ^h 8 ^m 49 ^s .775			9 ^h 25 ^m 30 ^s .501			9 ^h 36 ^m 20 ^s .688			10 ^h 21 ^m 12 ^s .394		
+88° 52' 49".08			-85° 20' 12".12			+81° 41' 25".82			-80° 34' 23".04			+82° 58' 35".87		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

77 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			K Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
Oct. 10 59	-84 9		Oct. 12 13	+88 8		Oct. 12 46	-84 40		Oct. 12 48	+83 51		Oct. 13 27	-85 22	
0.9	44.17	23.00	0.9	47.54	53.36	1.0	7.10	63.11	1.0	18.78	12.16	1.0	19.64	24.09
1.9	44.24	22.68	1.9	47.60	53.00	2.0	7.08	62.77	2.0	18.75	11.79	2.0	19.57	23.77
2.9	44.34	22.36	2.9	47.65	52.67	2.9	7.08	62.42	3.0	18.73	11.45	3.0	19.51	23.44
3.9	44.44	22.05	3.9	47.68	52.32	3.9	7.08	62.06	3.9	18.71	11.11	4.0	19.46	23.07
4.9	44.57	21.77	4.9	47.69	51.96	4.9	7.10	61.72	4.9	18.69	10.75	5.0	19.43	22.72
5.9	44.70	21.49	5.9	47.70	51.61	5.9	7.14	61.38	5.9	18.66	10.39	6.0	19.43	22.38
6.9	44.83	21.22	6.9	47.70	51.25	6.9	7.18	61.05	6.9	18.63	10.02	7.0	19.43	22.05
7.9	44.97	20.94	7.9	47.72	50.87	7.9	7.23	60.74	7.9	18.60	9.64	8.0	19.44	21.73
8.9	45.11	20.70	8.9	47.76	50.46	8.9	7.29	60.43	8.9	18.59	9.26	9.0	19.47	21.42
9.9	45.24	20.47	9.9	47.83	50.06	9.9	7.35	60.15	9.9	18.58	8.85	10.0	19.48	21.14
10.9	45.37	20.25	10.9	47.94	49.65	10.9	7.40	59.88	10.9	18.58	8.43	11.0	19.49	20.85
11.9	45.49	20.02	11.9	48.10	49.24	11.9	7.44	59.60	11.9	18.61	8.02	12.0	19.50	20.56
12.9	45.61	19.78	12.9	48.30	48.84	12.9	7.48	59.32	12.9	18.64	7.61	13.0	19.50	20.27
13.9	45.72	19.55	13.9	48.53	48.45	13.9	7.52	59.04	13.9	18.67	7.20	13.9	19.49	19.97
14.9	45.84	19.30	14.9	48.78	48.07	14.9	7.55	58.74	14.9	18.71	6.81	14.9	19.48	19.66
15.9	45.97	19.05	15.9	49.01	47.72	15.9	7.58	58.42	15.9	18.75	6.44	15.9	19.48	19.35
16.9	46.10	18.79	16.9	49.21	47.38	16.9	7.62	58.10	16.9	18.79	6.07	16.9	19.48	19.02
17.9	46.26	18.53	17.9	49.39	47.05	17.9	7.71	57.76	17.9	18.79	5.71	17.9	19.51	18.66
18.9	46.43	18.28	18.9	49.53	46.70	18.9	7.80	57.42	18.9	18.81	5.36	18.9	19.56	18.32
19.9	46.61	18.05	19.9	49.65	46.34	19.9	7.92	57.10	19.9	18.81	5.00	19.9	19.65	17.98
20.9	46.80	17.87	20.9	49.76	45.97	20.9	8.04	56.81	20.9	18.81	4.62	20.9	19.74	17.66
21.9	46.99	17.70	21.9	49.91	45.57	21.9	8.16	56.53	21.9	18.84	4.22	21.9	19.84	17.36
22.9	47.17	17.54	22.9	50.11	45.17	22.9	8.28	56.28	22.9	18.86	3.81	22.9	19.94	17.08
23.9	47.34	17.38	23.9	50.35	44.75	23.9	8.40	56.04	23.9	18.91	3.39	23.9	20.03	16.82
24.9	47.50	17.21	24.9	50.64	44.35	24.9	8.50	55.81	24.9	18.97	2.97	24.9	20.11	16.56
25.9	47.65	17.05	25.9	50.99	43.97	25.9	8.59	55.56	25.9	19.05	2.55	25.9	20.16	16.29
26.9	47.80	16.87	26.9	51.35	43.62	26.9	8.67	55.29	26.9	19.12	2.18	26.9	20.22	16.01
27.9	47.97	16.68	27.9	51.71	43.27	27.9	8.76	55.01	27.9	19.20	1.80	27.9	20.27	15.69
28.9	48.13	16.46	28.9	52.05	42.94	28.9	8.85	54.70	28.9	19.28	1.46	28.9	20.33	15.38
29.9	48.30	16.26	29.9	52.39	42.62	29.9	8.97	54.39	29.9	19.35	1.12	29.9	20.41	15.07
30.8	48.49	16.07	30.9	52.70	42.31	30.9	9.09	54.09	30.9	19.41	0.79	30.9	20.50	14.75
31.8	48.68	15.89	31.9	52.98	42.01	31.9	9.22	53.78	31.9	19.47	0.47	31.9	20.61	14.41
9.82	-9.77		30.92	+30.90		10.79	-10.75		9.34	+9.28		12.39	-12.35	
10 ^h 59 ^m 54 ^s .915			12 ^h 14 ^m 28 ^s .804			12 ^h 46 ^m 13 ^s .131			12 ^h 48 ^m 30 ^s .862			13 ^h 27 ^m 23 ^s .749		
-84° 9' 9".97			+88° 9' 16".14			-84° 40' 41".95			+83° 51' 30".88			-85° 22' 0".86		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Oct.	14 13	-83 17	Oct.	15 2	+87 32	Oct.	15 24	-84 11	Oct.	16 54	+82 10	Oct.	17 16	-80 47
	s	"		s	"		s	"		s	"		s	"
1.1	38.05	61.98	1.1	36.06	54.29	1.1	15.83	67.14	1.2	8.41	40.38	1.2	15.60	29.33
2.1	37.96	61.66	2.1	35.73	54.00	2.1	15.68	66.88	2.2	8.24	40.23	2.2	15.47	29.23
3.1	37.88	61.34	3.1	35.39	53.74	3.1	15.54	66.62	3.2	8.08	40.09	3.2	15.33	29.10
4.1	37.82	61.01	4.1	35.03	53.47	4.1	15.39	66.35	4.2	7.92	39.96	4.2	15.20	28.96
5.1	37.76	60.68	5.1	34.67	53.21	5.1	15.25	66.06	5.2	7.76	39.85	5.2	15.07	28.81
6.1	37.71	60.35	6.1	34.30	52.95	6.1	15.14	65.78	6.2	7.59	39.72	6.2	14.95	28.64
7.0	37.67	60.02	7.1	33.92	52.68	7.1	15.04	65.49	7.2	7.43	39.59	7.2	14.84	28.46
8.0	37.64	59.70	8.1	33.53	52.38	8.1	14.95	65.19	8.2	7.26	39.45	8.2	14.74	28.28
9.0	37.62	59.42	9.1	33.15	52.06	9.1	14.86	64.92	9.2	7.09	39.29	9.2	14.64	28.10
10.0	37.60	59.12	10.1	32.77	51.75	10.1	14.77	64.66	10.2	6.92	39.12	10.2	14.54	27.95
11.0	37.58	58.85	11.1	32.42	51.41	11.1	14.69	64.42	11.1	6.75	38.91	11.2	14.45	27.80
12.0	37.56	58.58	12.1	32.09	51.05	12.1	14.60	64.18	12.1	6.58	38.69	12.2	14.35	27.67
13.0	37.53	58.31	13.1	31.78	50.68	13.1	14.52	63.94	13.1	6.44	38.47	13.2	14.26	27.54
14.0	37.49	58.02	14.1	31.50	50.33	14.1	14.42	63.69	14.1	6.29	38.23	14.2	14.17	27.41
15.0	37.45	57.75	15.1	31.26	49.98	15.1	14.31	63.43	15.1	6.14	38.00	15.2	14.06	27.27
16.0	37.41	57.44	16.1	31.02	49.65	16.1	14.21	63.16	16.1	5.99	37.77	16.2	13.94	27.09
17.0	37.38	57.10	17.1	30.78	49.32	17.1	14.10	62.85	17.1	5.85	37.56	17.1	13.82	26.91
18.0	37.36	56.75	18.1	30.51	49.01	18.1	14.01	62.53	18.1	5.71	37.37	18.1	13.70	26.69
19.0	37.35	56.41	19.1	30.24	48.70	19.1	13.95	62.19	19.1	5.57	37.18	19.1	13.60	26.46
20.0	37.37	56.06	20.0	29.92	48.39	20.1	13.89	61.86	20.1	5.42	37.00	20.1	13.50	26.22
21.0	37.40	55.73	21.0	29.60	48.07	21.1	13.85	61.54	21.1	5.26	36.81	21.1	13.43	25.97
22.0	37.44	55.41	22.0	29.28	47.72	22.1	13.82	61.24	22.1	5.11	36.59	22.1	13.36	25.73
23.0	37.48	55.13	23.0	28.99	47.37	23.1	13.82	60.96	23.1	4.95	36.36	23.1	13.30	25.50
24.0	37.51	54.85	24.0	28.71	46.99	24.1	13.79	60.69	24.1	4.80	36.10	24.1	13.24	25.27
25.0	37.55	54.59	25.0	28.47	46.60	25.0	13.75	60.42	25.1	4.65	35.83	25.1	13.16	25.09
25.9	37.55	54.32	26.0	28.27	46.21	26.0	13.71	60.15	26.1	4.52	35.54	26.1	13.09	24.90
26.9	37.55	54.03	27.0	28.11	45.82	27.0	13.66	59.87	27.1	4.39	35.25	27.1	13.01	24.71
27.9	37.56	53.72	28.0	27.97	45.44	28.0	13.60	59.57	28.1	4.27	34.96	28.1	12.92	24.49
28.9	37.56	53.41	29.0	27.83	45.10	29.0	13.54	59.25	29.1	4.15	34.69	29.1	12.82	24.27
29.9	37.57	53.08	30.0	27.69	44.77	30.0	13.49	58.92	30.1	4.03	34.42	30.1	12.73	24.04
30.9	37.60	52.73	31.0	27.54	44.44	31.0	13.45	58.59	31.1	3.93	34.18	31.1	12.64	23.77
31.9	37.63	52.37	32.0	27.38	44.11	32.0	13.41	58.25	32.1	3.81	33.94	32.1	12.55	23.50
8.57	-8.51		23.37	+23.34		9.90	-9.85		7.35	+7.28		6.25	-6.17	
14 ^h 13 ^m	37° 06'		15 ^h 3 ^m	21° 50'		15 ^h 24 ^m	9° 56'		16 ^h 54 ^m	19° 23'		17 ^h 16 ^m	6° 06'	
-83° 17'	37° 78'		+87° 32'	56° 60'		-84° 11'	42° 92'		+82° 10'	27° 09'		-80° 47'	10° 43'	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			γ Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '
	17 58	+86 37		18 7	-87 40		18 59	+89 1		19 30	-89 13		20 48	+82 14
	s	"		s	"		s	"		s	"		s	"
1.2	17.41	11.52	1.2	22.47	7.67	1.3	79.08	33.48	1.3	77.80	29.52	1.3	37.41	15.50
2.2	17.03	11.46	2.2	21.90	7.64	2.3	77.71	33.52	2.3	76.15	29.62	2.3	37.27	15.78
3.2	16.64	11.42	3.2	21.33	7.58	3.3	76.36	33.56	3.3	74.44	29.70	3.3	37.13	15.86
4.2	16.24	11.38	4.2	20.76	7.51	4.3	75.01	33.62	4.3	72.72	29.76	4.3	36.99	16.19
5.2	15.84	11.34	5.2	20.20	7.43	5.3	73.65	33.69	5.3	71.00	29.81	5.3	36.86	16.41
6.2	15.43	11.33	6.2	19.67	7.33	6.3	72.26	33.77	6.3	69.30	29.82	6.3	36.72	16.63
7.2	15.02	11.30	7.2	19.15	7.22	7.2	70.83	33.85	7.3	67.65	29.83	7.3	36.58	16.86
8.2	14.60	11.26	8.2	18.67	7.11	8.2	69.36	33.91	8.3	66.07	29.82	8.3	36.43	17.09
9.2	14.16	11.22	9.2	18.20	6.99	9.2	67.82	33.97	9.3	64.55	29.80	9.3	36.29	17.31
10.2	13.71	11.14	10.2	17.76	6.88	10.2	66.24	34.02	10.3	63.08	29.79	10.3	36.12	17.54
11.2	13.26	11.06	11.2	17.32	6.78	11.2	64.62	34.03	11.3	61.68	29.79	11.3	35.95	17.74
12.2	12.81	10.94	12.2	16.89	6.68	12.2	63.00	34.05	12.3	60.28	29.81	12.3	35.79	17.93
13.2	12.39	10.81	13.2	16.45	6.60	13.2	61.39	34.02	13.3	58.87	29.84	13.3	35.61	18.10
14.2	11.96	10.67	14.2	15.99	6.53	14.2	59.84	33.98	14.2	57.41	29.87	14.3	35.44	18.25
15.2	11.57	10.53	15.2	15.49	6.45	15.2	58.34	33.95	15.2	55.86	29.91	15.3	35.26	18.38
16.2	11.18	10.40	16.2	14.98	6.35	16.2	56.92	33.92	16.2	54.22	29.91	16.3	35.09	18.51
17.2	10.81	10.29	17.2	14.46	6.21	17.2	55.55	33.89	17.2	52.51	29.90	17.3	34.94	18.63
18.2	10.43	10.18	18.2	13.94	6.04	18.2	54.19	33.88	18.2	50.76	29.86	18.3	34.79	18.76
19.2	10.05	10.09	19.2	13.45	5.86	19.2	52.82	33.88	19.2	49.04	29.79	19.3	34.65	18.93
20.2	9.65	10.00	20.2	12.97	5.67	20.2	51.40	33.89	20.2	47.38	29.69	20.3	34.50	19.10
21.2	9.24	9.92	21.2	12.55	5.47	21.2	49.91	33.91	21.2	45.82	29.59	21.3	34.34	19.29
22.2	8.82	9.81	22.2	12.17	5.26	22.2	48.34	33.93	22.2	44.36	29.49	22.3	34.17	19.47
23.2	8.39	9.69	23.2	11.81	5.06	23.2	46.72	33.91	23.2	43.00	29.40	23.3	34.00	19.64
24.2	7.96	9.55	24.2	11.45	4.88	24.2	45.09	33.87	24.2	41.68	29.31	24.3	33.82	19.78
25.2	7.53	9.37	25.2	11.09	4.73	25.2	43.48	33.80	25.2	40.34	29.25	25.3	33.64	19.90
26.2	7.13	9.17	26.2	10.70	4.59	26.2	41.93	33.71	26.2	38.97	29.19	26.3	33.45	20.00
27.1	6.75	8.98	27.2	10.28	4.44	27.2	40.45	33.62	27.2	37.50	29.14	27.3	33.27	20.06
28.1	6.38	8.78	28.2	9.84	4.27	28.2	39.03	33.52	28.2	35.96	29.08	28.3	33.09	20.12
29.1	6.05	8.59	29.2	9.39	4.10	29.2	37.68	33.42	29.2	34.35	29.01	29.3	32.92	20.17
30.1	5.72	8.42	30.1	8.92	3.89	30.2	36.37	33.33	30.2	32.69	28.92	30.3	32.76	20.23
31.1	5.39	8.24	31.1	8.46	3.67	31.2	35.08	33.25	31.2	31.01	28.80	31.3	32.60	20.29
32.1	5.06	8.08	32.1	8.03	3.44	32.2	33.80	33.17	32.2	29.34	28.67	32.3	32.44	20.37
16.96	+16.93		24.58	-24.56		58.84	+58.83		73.93	-73.92		7.40	+7.34	
17 ^h 58 ^m 41 ^s .809			18 ^h 6 ^m 47 ^s .620			19 ^h 1 ^m 27 ^s .463			19 ^h 29 ^m 16 ^s .746			20 ^h 48 ^m 36 ^s .323		
+86° 36' 51".12			-87° 39' 51".38			+89° 1' 7".53			-89° 13' 21".02			+82° 13' 43".34		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "
Oct.	21 38	-83 5	Oct.	22 16	-86 22	Oct.	22 37	-81 48	Oct.	23 28	+86 51	Oct.	23 47	-82 28
1.4	46.11	44.23	1.4	49.15	59.10	1.4	59.17	30.78	1.4	7.22	46.31	1.5	32.55	9.58
2.4	45.98	44.48	2.4	48.95	59.39	2.4	59.09	31.09	2.4	7.11	46.65	2.5	32.52	9.92
3.4	45.84	44.73	3.4	48.72	59.67	3.4	59.01	31.39	3.4	7.01	46.98	3.5	32.47	10.26
4.4	45.69	44.96	4.4	48.48	59.93	4.4	58.91	31.68	4.4	6.92	47.32	4.5	32.42	10.60
5.4	45.53	45.17	5.4	48.23	60.18	5.4	58.81	31.96	5.4	6.82	47.67	5.5	32.36	10.93
6.4	45.38	45.36	6.4	47.97	60.42	6.4	58.71	32.21	6.4	6.73	48.01	6.4	32.29	11.25
7.4	45.23	45.55	7.4	47.71	60.64	7.4	58.62	32.45	7.4	6.64	48.37	7.4	32.22	11.55
8.4	45.09	45.72	8.4	47.46	60.85	8.4	58.51	32.69	8.4	6.55	48.76	8.4	32.15	11.84
9.4	44.95	45.88	9.4	47.21	61.05	9.4	58.42	32.91	9.4	6.43	49.16	9.4	32.09	12.12
10.3	44.82	46.03	10.4	47.00	61.25	10.4	58.33	33.12	10.4	6.30	49.56	10.4	32.04	12.38
11.3	44.69	46.19	11.4	46.79	61.45	11.4	58.25	33.34	11.4	6.13	49.95	11.4	31.99	12.65
12.3	44.57	46.36	12.4	46.57	61.65	12.4	58.17	33.57	12.4	5.95	50.33	12.4	31.95	12.93
13.3	44.45	46.53	13.4	46.36	61.86	13.4	58.09	33.79	13.4	5.74	50.69	13.4	31.90	13.20
14.3	44.32	46.72	14.4	46.15	62.08	14.4	58.01	34.03	14.4	5.52	51.03	14.4	31.85	13.48
15.3	44.18	46.91	15.4	45.92	62.31	15.4	57.93	34.29	15.4	5.30	51.36	15.4	31.79	13.78
16.3	44.03	47.11	16.4	45.66	62.53	16.4	57.82	34.54	16.4	5.10	51.67	16.4	31.71	14.09
17.3	43.86	47.30	17.4	45.38	62.75	17.4	57.70	34.79	17.4	4.91	51.98	17.4	31.63	14.39
18.3	43.69	47.45	18.4	45.07	62.95	18.4	57.58	35.02	18.4	4.75	52.29	18.4	31.54	14.69
19.3	43.51	47.59	19.4	44.75	63.14	19.4	57.45	35.23	19.4	4.60	52.62	19.4	31.44	14.99
20.3	43.33	47.69	20.3	44.42	63.31	20.4	57.32	35.43	20.4	4.45	52.97	20.4	31.33	15.26
21.3	43.17	47.78	21.3	44.10	63.45	21.4	57.20	35.59	21.4	4.29	53.33	21.4	31.22	15.51
22.3	43.01	47.85	22.3	43.80	63.56	22.4	57.08	35.74	22.4	4.11	53.70	22.4	31.12	15.74
23.3	42.86	47.93	23.3	43.54	63.68	23.4	56.97	35.89	23.4	3.91	54.07	23.4	31.03	15.96
24.3	42.72	48.00	24.3	43.29	63.80	24.4	56.87	36.04	24.4	3.68	54.42	24.4	30.94	16.18
25.3	42.59	48.10	25.3	43.04	63.93	25.3	56.77	36.21	25.4	3.42	54.77	25.4	30.86	16.41
26.3	42.44	48.21	26.3	42.78	64.09	26.3	56.66	36.38	26.4	3.15	55.09	26.4	30.78	16.64
27.3	42.29	48.32	27.3	42.51	64.26	27.3	56.56	36.56	27.4	2.86	55.39	27.4	30.70	16.89
28.3	42.13	48.44	28.3	42.22	64.43	28.3	56.44	36.74	28.4	2.58	55.68	28.4	30.60	17.16
29.3	41.95	48.56	29.3	41.91	64.59	29.3	56.31	36.93	29.4	2.31	55.96	29.4	30.50	17.43
30.3	41.77	48.67	30.3	41.59	64.74	30.3	56.17	37.12	30.4	2.06	56.23	30.4	30.38	17.70
31.3	41.58	48.77	31.3	41.24	64.89	31.3	56.03	37.31	31.4	1.81	56.49	31.4	30.26	17.98
32.3	41.39	48.85	32.3	40.88	65.01	32.3	55.88	37.50	32.4	1.57	56.76	32.4	30.13	18.23
8.32	-8.26		15.86	-15.82		7.02	-6.95		18.28	+18.25		7.63	-7.56	
21 ^h 38 ^m 29 ^s .050			22 ^h 16 ^m 20 ^s .949			22 ^h 37 ^m 45 ^s .323			23 ^h 27 ^m 43 ^s .851			23 ^h 47 ^m 20 ^s .032		
-83° 5' 50".66			-86° 23' 9".03			-81° 48' 43".57			+86° 51' 18".76			-82° 28' 28".42		

APPARENT PLACES OF STARS, 1918.

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

48 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 94 Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Nov.	h m	° ' "	Nov.	h m	° ' "	Nov.	h m	° ' "	Nov.	h m	° ' "	Nov.	h m	° ' "
	0 57	+85 49		1 32	+88 52		1 42	-85 10		4 10	+85 20		5 36	+85
	s	"		s	"		s	"		s	"		s	"
0.4	43.54	35.20	0.5	25.21	28.19	0.5	7.74	48.09	0.6	55.81	21.45	0.6	4.23	19.
1.4	43.47	35.51	1.4	25.13	28.53	1.5	7.65	48.44	1.6	55.98	21.72	1.6	4.45	20.
2.4	43.41	35.83	2.4	25.07	28.88	2.5	7.55	48.78	2.6	56.15	21.98	2.6	4.68	20.
3.4	43.35	36.18	3.4	25.02	29.22	3.5	7.44	49.11	3.6	56.32	22.24	3.6	4.92	20.
4.4	43.30	36.53	4.4	24.96	29.57	4.4	7.32	49.43	4.6	56.51	22.52	4.6	5.18	20.
5.4	43.24	36.89	5.4	24.88	29.94	5.4	7.20	49.72	5.6	56.70	22.83	5.6	5.44	20.
6.4	43.16	37.26	6.4	24.77	30.32	6.4	7.08	50.00	6.5	56.89	23.14	6.6	5.70	21.
7.4	43.07	37.64	7.4	24.60	30.72	7.4	6.97	50.27	7.5	57.07	23.47	7.6	5.95	21.
8.4	42.97	38.01	8.4	24.35	31.11	8.4	6.87	50.54	8.5	57.24	23.81	8.6	6.20	21.
9.4	42.83	38.37	9.4	24.04	31.49	9.4	6.78	50.80	9.5	57.39	24.17	9.6	6.44	21.
10.4	42.69	38.71	10.4	23.66	31.87	10.4	6.68	51.08	10.5	57.52	24.53	10.6	6.67	22.
11.4	42.53	39.04	11.4	23.24	32.22	11.4	6.58	51.36	11.5	57.64	24.88	11.6	6.87	22.
12.4	42.37	39.34	12.4	22.81	32.56	12.4	6.48	51.66	12.5	57.74	25.22	12.6	7.07	22.
13.4	42.22	39.63	13.4	22.40	32.89	13.4	6.36	51.97	13.5	57.83	25.53	13.6	7.25	22.
14.4	42.08	39.92	14.4	22.06	33.20	14.4	6.22	52.28	14.5	57.93	25.83	14.6	7.42	23.
15.4	41.97	40.21	15.4	21.77	33.50	15.4	6.06	52.61	15.5	58.06	26.12	15.6	7.61	23.
16.4	41.86	40.51	16.4	21.52	33.82	16.4	5.89	52.91	16.5	58.18	26.39	16.6	7.82	23.
17.4	41.76	40.83	17.4	21.30	34.16	17.4	5.70	53.18	17.5	58.33	26.70	17.6	8.04	23.
18.4	41.66	41.16	18.4	21.05	34.52	18.4	5.51	53.43	18.5	58.48	27.01	18.6	8.27	23.
19.4	41.54	41.50	19.4	20.74	34.89	19.4	5.33	53.66	19.5	58.62	27.34	19.6	8.50	24.
20.4	41.39	41.84	20.4	20.35	35.28	20.4	5.16	53.88	20.5	58.76	27.70	20.6	8.73	24.
21.4	41.22	42.18	21.4	19.86	35.65	21.4	5.00	54.09	21.5	58.88	28.07	21.6	8.94	24.
22.4	41.04	42.50	22.4	19.32	36.00	22.4	4.85	54.30	22.5	58.98	28.44	22.6	9.14	25.
23.4	40.84	42.80	23.4	18.71	36.33	23.4	4.71	54.53	23.5	59.04	28.81	23.6	9.31	25.
24.4	40.63	43.08	24.4	18.05	36.65	24.4	4.56	54.76	24.5	59.10	29.15	24.6	9.46	25.
25.4	40.43	43.33	25.4	17.41	36.94	25.4	4.40	55.03	25.5	59.14	29.49	25.6	9.60	26.
26.4	40.22	43.58	26.4	16.80	37.22	26.4	4.22	55.29	26.5	59.18	29.81	26.6	9.73	26.
27.4	40.02	43.82	27.4	16.20	37.49	27.4	4.04	55.56	27.5	59.22	30.12	27.5	9.86	26.
28.4	39.83	44.05	28.4	15.64	37.75	28.4	3.84	55.83	28.5	59.25	30.42	28.5	9.98	26.
29.4	39.65	44.28	29.4	15.11	38.01	29.4	3.62	56.08	29.5	59.30	30.72	29.5	10.11	27.
30.3	39.48	44.52	30.4	14.59	38.29	30.4	3.40	56.32	30.5	59.35	31.01	30.5	10.25	27.
31.3	39.31	44.77	31.4	14.06	38.58	31.4	3.17	56.54	31.5	59.41	31.32	31.5	10.40	27.
13.74	+13.71		50.98	+50.97		11.90	-11.86		12.31	+12.27		11.84	+11.80	
0 ^h 57 ^m	16° 9.95'		1 ^h 30 ^m	42° 3.307'		1 ^h 41 ^m	58° 5.587'		4 ^h 10 ^m	20° 1.187'		5 ^h 35 ^m	31° 5	
+85° 49'	4'' 7.2		+88° 52'	2'' 0.6		-85° 11'	3'' 34		+85° 20'	19'' 6.2		+85° 9'	32'' 1.3	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Menae. Mag. 6.2			C Menae. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '
	5 45	-84 49		6 46	-80 43		7 3	+87 10		7 14	+82 33		7 15	-86 54
	s	"		s	"		s	"		s	"		s	"
0.6	59.71	31.75	0.7	52.04	30.95	0.7	16.59	23.76	0.7	13.09	57.39	0.7	46.63	4.25
1.6	59.89	32.02	1.7	52.17	31.16	1.7	17.04	23.82	1.7	13.26	57.44	1.7	47.04	4.42
2.6	60.06	32.30	2.7	52.30	31.38	2.7	17.50	23.88	2.7	13.44	57.47	2.7	47.42	4.60
3.6	60.23	32.59	3.7	52.42	31.61	3.7	17.98	23.93	3.7	13.63	57.50	3.7	47.80	4.79
4.6	60.37	32.88	4.7	52.54	31.85	4.7	18.47	24.00	4.7	13.81	57.54	4.7	48.16	4.99
5.6	60.51	33.17	5.7	52.64	32.09	5.7	18.97	24.08	5.7	14.01	57.58	5.7	48.51	5.19
6.6	60.65	33.45	6.7	52.75	32.33	6.7	19.50	24.16	6.7	14.23	57.64	6.7	48.84	5.38
7.6	60.77	33.73	7.7	52.85	32.56	7.7	20.02	24.25	7.7	14.44	57.72	7.7	49.16	5.57
8.6	60.91	33.99	8.6	52.95	32.77	8.7	20.55	24.38	8.7	14.65	57.82	8.7	49.46	5.75
9.6	61.04	34.25	9.6	53.05	32.99	9.7	21.07	24.53	9.7	14.85	57.95	9.7	49.77	5.91
10.6	61.16	34.49	10.6	53.16	33.18	10.7	21.56	24.69	10.7	15.05	58.09	10.7	50.07	6.08
11.6	61.30	34.75	11.6	53.27	33.40	11.7	22.03	24.84	11.7	15.24	58.23	11.7	50.40	6.25
12.6	61.44	35.01	12.6	53.37	33.62	12.6	22.47	25.00	12.7	15.41	58.37	12.7	50.74	6.43
13.6	61.58	35.31	13.6	53.48	33.86	13.6	22.88	25.15	13.7	15.58	58.50	13.7	51.10	6.64
14.6	61.72	35.63	14.6	53.59	34.13	14.6	23.28	25.29	14.7	15.74	58.60	14.7	51.46	6.86
15.6	61.86	35.98	15.6	53.70	34.41	15.6	23.69	25.42	15.6	15.90	58.69	15.7	51.80	7.13
16.6	61.96	36.34	16.6	53.80	34.73	16.6	24.12	25.51	16.6	16.07	58.77	16.6	52.13	7.40
17.6	62.06	36.68	17.6	53.90	35.06	17.6	24.57	25.61	17.6	16.25	58.84	17.6	52.43	7.68
18.6	62.14	37.02	18.6	53.99	35.38	18.6	25.06	25.74	18.6	16.44	58.93	18.6	52.70	7.96
19.6	62.22	37.36	19.6	54.07	35.69	19.6	25.56	25.88	19.6	16.65	59.04	19.6	52.94	8.23
20.6	62.27	37.68	20.6	54.14	35.98	20.6	26.06	26.04	20.6	16.85	59.17	20.6	53.18	8.50
21.6	62.35	37.98	21.6	54.21	36.26	21.6	26.55	26.22	21.6	17.06	59.33	21.6	53.42	8.75
22.6	62.42	38.27	22.6	54.30	36.51	22.6	27.01	26.44	22.6	17.25	59.51	22.6	53.66	8.97
23.6	62.50	38.55	23.6	54.37	36.77	23.6	27.44	26.66	23.6	17.42	59.69	23.6	53.92	9.19
24.6	62.59	38.85	24.6	54.45	37.03	24.6	27.83	26.89	24.6	17.58	59.89	24.6	54.18	9.42
25.6	62.67	39.16	25.6	54.54	37.31	25.6	28.20	27.11	25.6	17.72	60.08	25.6	54.44	9.66
26.6	62.75	39.49	26.6	54.63	37.62	26.6	28.55	27.32	26.6	17.86	60.27	26.6	54.74	9.93
27.6	62.84	39.85	27.6	54.71	37.93	27.6	28.89	27.52	27.6	18.00	60.45	27.6	55.03	10.20
28.6	62.90	40.21	28.6	54.79	38.26	28.6	29.22	27.71	28.6	18.14	60.62	28.6	55.31	10.51
29.6	62.96	40.58	29.6	54.86	38.61	29.6	29.58	27.89	29.6	18.28	60.79	29.6	55.57	10.82
30.5	63.02	40.95	30.6	54.94	38.97	30.6	29.93	28.07	30.6	18.42	60.93	30.6	55.82	11.13
31.5	63.07	41.33	31.6	54.99	39.34	31.6	30.30	28.26	31.6	18.58	61.10	31.6	56.05	11.46
11.09	-11.05		6.20	-6.12		20.28	+20.26		7.73	+7.66		18.50	-18.48	
5 ^h 46 ^m	3 ^s .075		6 ^h 46 ^m	53 ^s .600		7 ^h 2 ^m	33 ^s .206		7 ^h 13 ^m	55 ^s .106		7 ^h 16 ^m	0 ^s .004	
-84° 49'	45'' 59		-80° 43'	42'' 15		+87° 10'	49'' 32		+82° 34'	23'' 73		-86° 54'	13'' 24	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			♄ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			♄ Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Nov.	h m	s	Nov.	h m	s	Nov.	h m	s	Nov.	h m	s	Nov.	h m	s
	8 17	+88 52		9 8	-85 20		9 25	+81 40		9 36	-80 34		10 21	+82 57
	s	"		s	"		s	"		s	"		s	"
0.7	58.65	15.28	0.8	39.98	10.49	0.8	38.05	48.68	0.8	17.66	23.03	0.8	15.54	57.50
1.7	59.78	15.23	1.8	40.27	10.48	1.8	38.20	48.53	1.8	17.81	22.98	1.8	15.69	57.28
2.7	60.94	15.18	2.8	40.58	10.48	2.8	38.34	48.38	2.8	17.96	22.96	2.8	15.85	57.06
3.7	62.12	15.12	3.8	40.87	10.53	3.8	38.51	48.21	3.8	18.11	22.95	3.8	16.00	56.84
4.7	63.36	15.06	4.8	41.17	10.57	4.8	38.67	48.03	4.8	18.26	22.96	4.8	16.17	56.60
5.7	64.64	15.01	5.8	41.45	10.61	5.8	38.84	47.86	5.8	18.41	22.99	5.8	16.33	56.36
6.7	65.94	14.98	6.8	41.72	10.66	6.8	39.01	47.71	6.8	18.55	23.02	6.8	16.52	56.12
7.7	67.30	14.97	7.8	41.97	10.71	7.8	39.19	47.56	7.8	18.69	23.05	7.8	16.71	55.89
8.7	68.67	14.96	8.7	42.23	10.76	8.8	39.38	47.43	8.8	18.82	23.07	8.8	16.91	55.66
9.7	70.04	14.99	9.7	42.48	10.81	9.8	39.58	47.33	9.8	18.95	23.08	9.8	17.12	55.47
10.7	71.37	15.03	10.7	42.74	10.85	10.8	39.77	47.23	10.8	19.08	23.09	10.8	17.32	55.29
11.7	72.64	15.08	11.7	42.99	10.86	11.8	39.95	47.16	11.8	19.21	23.09	11.8	17.52	55.15
12.7	73.85	15.13	12.7	43.26	10.91	12.8	40.11	47.10	12.8	19.34	23.10	12.8	17.71	55.00
13.7	74.99	15.17	13.7	43.53	10.96	13.7	40.26	47.05	13.8	19.49	23.12	13.8	17.89	54.86
14.7	76.10	15.21	14.7	43.82	11.01	14.7	40.41	46.96	14.8	19.64	23.15	14.8	18.05	54.71
15.7	77.20	15.22	15.7	44.12	11.11	15.7	40.57	46.87	15.7	19.79	23.22	15.8	18.21	54.55
16.7	78.33	15.24	16.7	44.42	11.24	16.7	40.72	46.76	16.7	19.96	23.31	16.8	18.38	54.38
17.7	79.52	15.24	17.7	44.71	11.38	17.7	40.89	46.63	17.7	20.11	23.42	17.8	18.55	54.19
18.7	80.80	15.24	18.7	44.99	11.55	18.7	41.08	46.52	18.7	20.26	23.55	18.8	18.74	53.99
19.7	82.11	15.28	19.7	45.24	11.70	19.7	41.26	46.41	19.7	20.40	23.68	19.8	18.94	53.79
20.7	83.46	15.32	20.7	45.48	11.85	20.7	41.45	46.32	20.7	20.53	23.80	20.8	19.16	53.61
21.7	84.80	15.40	21.7	45.72	11.98	21.7	41.65	46.27	21.7	20.66	23.91	21.8	19.38	53.47
22.7	86.11	15.50	22.7	45.95	12.09	22.7	41.84	46.23	22.7	20.79	24.02	22.8	19.60	53.35
23.7	87.34	15.63	23.7	46.19	12.20	23.7	42.03	46.23	23.7	20.91	24.10	23.8	19.80	53.25
24.7	88.53	15.76	24.7	46.43	12.30	24.7	42.22	46.22	24.7	21.04	24.18	24.8	20.01	53.16
25.7	89.65	15.87	25.7	46.70	12.42	25.7	42.38	46.23	25.7	21.18	24.26	25.8	20.20	53.09
26.7	90.70	15.98	26.7	46.97	12.55	26.7	42.53	46.24	26.7	21.32	24.36	26.8	20.39	53.01
27.7	91.72	16.08	27.7	47.24	12.69	27.7	42.68	46.25	27.7	21.46	24.48	27.7	20.56	52.94
28.7	92.73	16.19	28.7	47.51	12.86	28.7	42.83	46.24	28.7	21.60	24.62	28.7	20.74	52.87
29.7	93.75	16.29	29.7	47.79	13.04	29.7	42.99	46.23	29.7	21.76	24.78	29.7	20.92	52.79
30.7	94.78	16.38	30.7	48.06	13.25	30.7	43.14	46.22	30.7	21.91	24.95	30.7	21.09	52.71
31.6	95.84	16.48	31.7	48.32	13.47	31.7	43.31	46.20	31.7	22.05	25.13	31.7	21.27	52.62
50.74 +50.73			12.30 -12.26			6.91 +6.84			6.11 -6.02			8.16 +8.10		
8 ^h 16 ^m 48 ^s .125			9 ^h 8 ^m 49 ^s .775			9 ^h 25 ^m 30 ^s .501			9 ^h 36 ^m 20 ^s .688			10 ^h 21 ^m 12 ^s .394		
+88° 52' 49".08			-85° 20' 12".12			+81° 41' 25".82			-80° 34' 23".04			+82° 58' 35".87		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

77 Octantis. Mag. 6.3			Bradley 1678. Mag. 6.3			ι Octantis. Mag. 5.4			33 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Nov.	10 59	-84 9	Nov.	12 13	+88 8	Nov.	12 46	-84 40	Nov.	12 48	+83 50	Nov.	13 27	-85 22
	s	"		s	"		s	"		s	"		s	"
0.8	48.68	15.89	0.9	52.98	42.01	0.9	9.22	53.78	0.9	19.47	60.47	0.9	20.61	14.41
1.8	48.91	15.72	1.9	53.26	41.70	1.9	9.37	53.49	1.9	19.53	60.13	1.9	20.74	14.08
2.8	49.12	15.57	2.9	53.53	41.38	2.9	9.54	53.21	2.9	19.59	59.78	2.9	20.88	13.79
3.8	49.34	15.44	3.9	53.81	41.04	3.9	9.70	52.95	3.9	19.65	59.42	3.9	21.02	13.50
4.8	49.56	15.32	4.9	54.12	40.70	4.9	9.87	52.71	4.9	19.71	59.06	4.9	21.19	13.21
5.8	49.78	15.22	5.9	54.44	40.34	5.9	10.06	52.48	5.9	19.78	58.69	5.9	21.35	12.93
6.8	49.97	15.13	6.9	54.81	39.99	6.9	10.23	52.26	6.9	19.87	58.31	6.9	21.50	12.68
7.8	50.18	15.04	7.9	55.22	39.64	7.9	10.39	52.06	7.9	19.96	57.93	7.9	21.65	12.44
8.8	50.38	14.95	8.9	55.67	39.30	8.9	10.54	51.85	8.9	20.09	57.54	8.9	21.80	12.20
9.8	50.56	14.85	9.9	56.14	38.96	9.9	10.69	51.63	9.9	20.21	57.16	9.9	21.93	11.96
10.8	50.75	14.74	10.9	56.65	38.65	10.9	10.83	51.41	10.9	20.33	56.80	10.9	22.06	11.70
11.8	50.93	14.62	11.9	57.16	38.37	11.9	10.98	51.19	11.9	20.45	56.47	11.9	22.19	11.44
12.8	51.14	14.50	12.9	57.63	38.09	12.9	11.14	50.95	12.9	20.58	56.15	12.9	22.33	11.18
13.8	51.36	14.40	13.9	58.07	37.81	13.9	11.31	50.71	13.9	20.68	55.86	13.9	22.49	10.90
14.8	51.58	14.30	14.9	58.49	37.55	14.9	11.50	50.47	14.9	20.78	55.57	14.9	22.67	10.61
15.8	51.82	14.23	15.9	58.87	37.29	15.9	11.72	50.25	15.9	20.88	55.26	15.9	22.86	10.33
16.8	52.07	14.18	16.9	59.24	36.99	16.9	11.94	50.05	16.9	20.97	54.95	16.9	23.09	10.08
17.8	52.32	14.14	17.9	59.63	36.68	17.9	12.17	49.86	17.9	21.07	54.62	17.9	23.32	9.85
18.8	52.56	14.14	18.8	60.04	36.37	18.9	12.40	49.72	18.9	21.17	54.26	18.9	23.55	9.66
19.8	52.79	14.14	19.8	60.52	36.05	19.9	12.62	49.58	19.9	21.30	53.90	19.9	23.78	9.47
20.8	53.01	14.15	20.8	61.05	35.74	20.9	12.84	49.45	20.9	21.44	53.54	20.9	24.00	9.28
21.8	53.21	14.15	21.8	61.62	35.45	21.9	13.04	49.32	21.9	21.59	53.20	21.9	24.20	9.10
22.8	53.41	14.15	22.8	62.21	35.16	22.9	13.23	49.18	22.9	21.76	52.88	22.9	24.38	8.90
23.8	53.60	14.11	23.8	62.82	34.91	23.9	13.41	49.01	23.9	21.93	52.59	23.9	24.56	8.70
24.8	53.82	14.07	24.8	63.42	34.69	24.9	13.60	48.84	24.9	22.08	52.31	24.9	24.74	8.49
25.8	54.04	14.03	25.8	63.98	34.48	25.9	13.80	48.67	25.9	22.23	52.04	25.9	24.94	8.27
26.8	54.27	14.01	26.8	64.53	34.28	26.8	14.01	48.49	26.9	22.38	51.78	26.9	25.15	8.05
27.8	54.49	14.00	27.8	65.05	34.08	27.8	14.23	48.31	27.8	22.52	51.54	27.9	25.37	7.83
28.8	54.74	14.00	28.8	65.57	33.89	28.8	14.46	48.14	28.8	22.66	51.30	28.9	25.62	7.61
29.8	54.99	14.00	29.8	66.07	33.67	29.8	14.70	48.00	29.8	22.80	51.06	29.9	25.86	7.40
30.8	55.24	14.04	30.8	66.57	33.46	30.8	14.96	47.86	30.8	22.93	50.79	30.9	26.13	7.21
31.8	55.49	14.09	31.8	67.08	33.24	31.8	15.23	47.73	31.8	23.07	50.52	31.9	26.41	7.03
9.82	-9.77		30.87	+30.86		10.79	-10.74		9.33	+9.28		12.39	-12.35	
10 ^h 59 ^m	54°.915		12 ^h 14 ^m	28°.804		12 ^h 46 ^m	13°.131		12 ^h 48 ^m	30°.862		13 ^h 27 ^m	23°.749	
-84° 9'	9'' .97		+88° 9'	16'' .14		-84° 40'	41'' .95		+83° 51'	30'' .88		-85° 22'	0'' .86	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Urae Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "
Nov. 14 13		-83 17	Nov. 15 2		+87 32	Nov. 15 24		-84 11	Nov. 16 54		+82 10	Nov. 17 16		-80 47
	s	"		s	"		s	"		s	"		s	"
0.9	37.63	52.37	1.0	27.38	44.11	1.0	13.41	58.25	1.1	3.81	33.94	1.1	12.55	23.50
1.9	37.68	52.04	2.0	27.21	43.79	2.0	13.40	57.89	2.1	3.68	33.69	2.1	12.47	23.21
2.9	37.74	51.71	3.0	27.03	43.48	3.0	13.40	57.55	3.1	3.56	33.45	3.1	12.41	22.92
3.9	37.81	51.39	4.0	26.85	43.15	4.0	13.40	57.21	4.1	3.45	33.19	4.1	12.35	22.63
4.9	37.89	51.08	5.0	26.67	42.78	5.0	13.43	56.89	5.1	3.33	32.93	5.1	12.29	22.35
5.9	37.97	50.79	6.0	26.50	42.42	6.0	13.45	56.58	6.1	3.20	32.65	6.1	12.25	22.07
6.9	38.06	50.51	6.9	26.35	42.05	7.0	13.48	56.29	7.1	3.08	32.34	7.1	12.21	21.79
7.9	38.14	50.24	7.9	26.22	41.66	8.0	13.51	56.00	8.1	2.98	32.02	8.1	12.17	21.55
8.9	38.20	49.98	8.9	26.13	41.25	9.0	13.54	55.73	9.1	2.87	31.70	9.1	12.13	21.30
9.9	38.26	49.72	9.9	26.07	40.83	10.0	13.55	55.46	10.1	2.77	31.37	10.1	12.09	21.06
10.9	38.32	49.46	10.9	26.03	40.45	11.0	13.56	55.18	11.1	2.68	31.03	11.1	12.05	20.82
11.9	38.38	49.19	11.9	26.02	40.08	12.0	13.56	54.87	12.1	2.59	30.69	12.1	11.99	20.55
12.9	38.44	48.87	12.9	26.01	39.72	12.9	13.57	54.55	13.1	2.51	30.37	13.1	11.93	20.27
13.9	38.52	48.57	13.9	25.98	39.39	13.9	13.59	54.21	14.1	2.42	30.08	14.1	11.87	19.97
14.9	38.61	48.26	14.9	25.94	39.05	14.9	13.62	53.87	15.1	2.34	29.80	15.1	11.82	19.68
15.9	38.71	47.95	15.9	25.87	38.72	15.9	13.67	53.51	16.1	2.26	29.52	16.1	11.78	19.38
16.9	38.84	47.66	16.9	25.79	38.39	16.9	13.75	53.16	17.0	2.16	29.24	17.1	11.77	19.00
17.9	38.97	47.38	17.9	25.69	38.03	17.9	13.84	52.82	18.0	2.07	28.95	18.1	11.76	18.67
18.9	39.11	47.13	18.9	25.60	37.66	18.9	13.94	52.51	19.0	1.97	28.64	19.1	11.75	18.35
19.9	39.25	46.90	19.9	25.56	37.28	19.9	14.03	52.23	20.0	1.89	28.32	20.1	11.75	18.06
20.9	39.38	46.68	20.9	25.54	36.87	20.9	14.12	51.96	21.0	1.80	27.95	21.1	11.75	17.78
21.9	39.50	46.47	21.9	25.56	36.46	21.9	14.21	51.69	22.0	1.72	27.58	22.0	11.75	17.51
22.9	39.60	46.24	22.9	25.60	36.06	22.9	14.27	51.43	23.0	1.66	27.20	23.0	11.75	17.25
23.9	39.70	46.01	23.9	25.69	35.68	23.9	14.33	51.16	24.0	1.61	26.83	24.0	11.72	16.98
24.9	39.80	45.78	24.9	25.80	35.32	24.9	14.39	50.88	25.0	1.56	26.49	25.0	11.69	16.70
25.9	39.91	45.50	25.9	25.91	34.96	25.9	14.46	50.58	26.0	1.52	26.15	26.0	11.66	16.39
26.9	40.03	45.24	26.9	26.01	34.63	26.9	14.54	50.27	27.0	1.47	25.81	27.0	11.64	16.07
27.9	40.16	44.96	27.9	26.10	34.31	27.9	14.62	49.95	28.0	1.42	25.48	28.0	11.63	15.74
28.9	40.29	44.69	28.9	26.17	34.00	28.9	14.70	49.63	29.0	1.38	25.17	29.0	11.62	15.41
29.9	40.44	44.44	29.9	26.25	33.69	29.9	14.82	49.30	30.0	1.33	24.86	30.0	11.62	15.07
30.9	40.60	44.19	30.9	26.32	33.37	30.9	14.94	48.99	31.0	1.29	24.55	31.0	11.63	14.73
31.9	40.76	43.96	31.9	26.38	33.04	31.9	15.08	48.70	32.0	1.23	24.23	32.0	11.64	14.38
8.57	-8.51		23.34	+23.32		9.89	-9.84		7.34	+7.28		6.25	-6.17	
14 ^h 13 ^m	37°.066		15 ^h 3 ^m	21°.809		15 ^h 24 ^m	9°.966		16 ^h 54 ^m	19°.238		17 ^h 16 ^m	6°.064	
-83° 17'	37''.78		+87° 32'	56''.60		-84° 11'	42''.92		+82° 10'	27''.09		-80° 47'	10''.43	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

5 Ursae Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursae Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '
	17 57	+86 37		18 7	-87 39		18 58	+89 1		19 29	-89 13		20 48	+82 14
	s	"		s	"		s	"		s	"		s	"
1.1	65.06	8.08	1.1	8.03	63.44	1.2	93.80	33.17	1.2	89.34	28.67	1.3	32.44	20.37
2.1	64.72	7.92	2.1	7.61	63.18	2.2	92.51	33.10	2.2	87.72	28.52	2.3	32.27	20.45
3.1	64.38	7.76	3.1	7.22	62.92	3.2	91.18	33.03	3.2	86.15	28.37	3.2	32.13	20.54
4.1	64.02	7.60	4.1	6.85	62.65	4.2	89.82	32.96	4.2	84.64	28.20	4.2	31.96	20.63
5.1	63.66	7.43	5.1	6.52	62.39	5.2	88.42	32.88	5.2	83.23	28.02	5.2	31.79	20.72
6.1	63.29	7.24	6.1	6.22	62.13	6.2	86.97	32.80	6.2	81.90	27.84	6.2	31.63	20.80
7.1	62.92	7.02	7.1	5.93	61.89	7.2	85.49	32.70	7.2	80.62	27.67	7.2	31.45	20.86
8.1	62.55	6.79	8.1	5.65	61.65	8.2	84.01	32.56	8.2	79.40	27.51	8.2	31.26	20.91
9.1	62.20	6.53	9.1	5.38	61.43	9.2	82.55	32.40	9.2	78.20	27.36	9.2	31.08	20.94
10.1	61.86	6.27	10.1	5.09	61.21	10.2	81.13	32.23	10.2	76.97	27.22	10.2	30.89	20.95
11.1	61.54	6.01	11.1	4.77	60.98	11.2	79.79	32.06	11.2	75.68	27.08	11.2	30.71	20.95
12.1	61.25	5.75	12.1	4.44	60.75	12.1	78.51	31.88	12.2	74.30	26.93	12.2	30.53	20.92
13.1	60.97	5.51	13.1	4.07	60.50	13.1	77.31	31.71	13.2	72.87	26.76	13.2	30.36	20.89
14.1	60.70	5.27	14.1	3.74	60.23	14.1	76.16	31.57	14.2	71.41	26.59	14.2	30.20	20.88
15.1	60.42	5.08	15.1	3.41	59.91	15.1	75.01	31.42	15.2	69.96	26.38	15.2	30.05	20.88
16.1	60.13	4.87	16.1	3.13	59.60	16.1	73.83	31.29	16.2	68.58	26.15	16.2	29.90	20.88
17.1	59.84	4.67	17.1	2.88	59.27	17.1	72.59	31.18	17.2	67.31	25.89	17.2	29.73	20.92
18.1	59.52	4.46	18.1	2.68	58.95	18.1	71.29	31.06	18.2	66.16	25.62	18.2	29.57	20.95
19.1	59.20	4.23	19.1	2.53	58.63	19.1	69.93	30.93	19.2	65.12	25.35	19.2	29.41	20.97
20.1	58.87	3.96	20.1	2.39	58.34	20.1	68.56	30.76	20.1	64.17	25.11	20.2	29.23	20.97
21.1	58.56	3.69	21.1	2.25	58.05	21.1	67.20	30.57	21.1	63.24	24.86	21.2	29.05	20.94
22.1	58.27	3.39	22.1	2.08	57.79	22.1	65.88	30.35	22.1	62.31	24.65	22.2	28.86	20.89
23.1	58.00	3.08	23.1	1.91	57.54	23.1	64.65	30.11	23.1	61.31	24.45	23.2	28.69	20.81
24.1	57.76	2.76	24.1	1.71	57.28	24.1	63.51	29.87	24.1	60.24	24.23	24.2	28.51	20.73
25.1	57.53	2.45	25.1	1.48	56.99	25.1	62.44	29.64	25.1	59.10	24.01	25.2	28.34	20.64
26.1	57.32	2.16	26.1	1.25	56.69	26.1	61.44	29.41	26.1	57.93	23.79	26.2	28.19	20.54
27.1	57.12	1.87	27.1	1.02	56.37	27.1	60.46	29.18	27.1	56.72	23.53	27.2	28.04	20.44
28.1	56.93	1.60	28.1	0.82	56.04	28.1	59.52	28.97	28.1	55.55	23.27	28.2	27.89	20.35
29.1	56.72	1.34	29.1	0.63	55.68	29.1	58.58	28.77	29.1	54.42	23.00	29.2	27.75	20.27
30.1	56.52	1.08	30.1	0.47	55.32	30.1	57.61	28.58	30.1	53.36	22.71	30.2	27.60	20.19
31.1	56.32	0.81	31.1	0.36	54.97	31.1	56.61	28.39	31.1	52.37	22.42	31.2	27.45	20.12
32.1	56.09	0.54	32.1	0.26	54.62	32.1	55.60	28.19	32.1	51.47	22.10	32.2	27.30	20.05
16.95	+16.92		24.56	-24.54		58.79	+58.78		73.84	-73.83		7.41	+7.34	
17 ^h 58 ^m 41 ^s .809			18 ^h 6 ^m 47 ^s .620			19 ^h 1 ^m 27 ^s .463			19 ^h 29 ^m 16 ^s .746			20 ^h 48 ^m 36 ^s .323		
+86° 36' 51".12			-87° 39' 51".38			+89° 1' 7".53			-89° 13' 21".02			+82° 13' 43".34		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Nov. 21 38	-83 5		Nov. 22 16	-86 23		Nov. 22 37	-81 48		Nov. 23 27	+86 51		Nov. 23 47	-82	
	s	"		s	"		s	"		s	"		s	"
1.3	41.39	48.85	1.3	40.88	5.01	1.3	55.88	37.50	1.4	61.57	56.76	1.4	30.13	18
2.3	41.19	48.91	2.3	40.52	5.12	2.3	55.73	37.66	2.4	61.35	57.03	2.4	29.99	18
3.3	41.00	48.96	3.3	40.15	5.22	3.3	55.58	37.81	3.4	61.12	57.31	3.4	29.85	18
4.3	40.82	48.98	4.3	39.80	5.30	4.3	55.43	37.92	4.4	60.87	57.60	4.4	29.72	18
5.3	40.64	48.99	5.3	39.46	5.36	5.3	55.29	38.02	5.4	60.61	57.90	5.4	29.58	19
6.3	40.47	49.00	6.3	39.14	5.40	6.3	55.15	38.11	6.4	60.35	58.20	6.4	29.45	19
7.3	40.31	49.00	7.3	38.83	5.46	7.3	55.02	38.19	7.3	60.07	58.51	7.4	29.33	19
8.3	40.16	49.01	8.3	38.53	5.52	8.3	54.90	38.28	8.3	59.76	58.81	8.4	29.22	19
9.3	40.01	49.04	9.3	38.24	5.58	9.3	54.77	38.38	9.3	59.43	59.09	9.4	29.11	19
10.3	39.86	49.07	10.3	37.95	5.64	10.3	54.65	38.49	10.3	59.08	59.34	10.4	28.99	19
11.3	39.70	49.09	11.3	37.64	5.71	11.3	54.53	38.60	11.3	58.73	59.58	11.4	28.87	20
12.3	39.53	49.11	12.3	37.32	5.79	12.3	54.40	38.71	12.3	58.38	59.81	12.3	28.74	20
13.3	39.35	49.13	13.3	36.97	5.87	13.3	54.25	38.82	13.3	58.06	60.01	13.3	28.60	20
14.3	39.16	49.14	14.3	36.60	5.93	14.3	54.09	38.93	14.3	57.76	60.21	14.3	28.45	20
15.3	38.96	49.12	15.3	36.22	5.97	15.3	53.92	39.00	15.3	57.47	60.43	15.3	28.29	20
16.2	38.76	49.09	16.3	35.84	5.98	16.3	53.76	39.05	16.3	57.19	60.66	16.3	28.13	20
17.2	38.57	49.02	17.3	35.46	5.98	17.3	53.60	39.08	17.3	56.92	60.93	17.3	27.96	20
18.2	38.40	48.93	18.3	35.11	5.95	18.3	53.45	39.09	18.3	56.64	61.19	18.3	27.80	20
19.2	38.23	48.85	19.3	34.77	5.90	19.3	53.31	39.08	19.3	56.33	61.45	19.3	27.65	20
20.2	38.08	48.76	20.3	34.46	5.84	20.3	53.17	39.08	20.3	55.98	61.70	20.3	27.51	20
21.2	37.94	48.68	21.3	34.17	5.80	21.3	53.05	39.07	21.3	55.61	61.93	21.3	27.38	20
22.2	37.80	48.61	22.3	33.87	5.78	22.3	52.93	39.08	22.3	55.22	62.14	22.3	27.25	20
23.2	37.65	48.55	23.3	33.56	5.77	23.3	52.80	39.10	23.3	54.82	62.33	23.3	27.12	20
24.2	37.50	48.50	24.3	33.25	5.77	24.3	52.67	39.13	24.3	54.43	62.51	24.3	26.99	20
25.2	37.33	48.45	25.2	32.92	5.76	25.3	52.52	39.16	25.3	54.05	62.66	25.3	26.84	20
26.2	37.15	48.41	26.2	32.56	5.75	26.3	52.37	39.18	26.3	53.67	62.80	26.3	26.68	20
27.2	36.96	48.34	27.2	32.20	5.73	27.3	52.21	39.20	27.3	53.33	62.93	27.3	26.51	20
28.2	36.78	48.26	28.2	31.83	5.71	28.3	52.04	39.21	28.3	52.99	63.07	28.3	26.34	20
29.2	36.59	48.15	29.2	31.45	5.64	29.3	51.88	39.21	29.3	52.65	63.21	29.3	26.16	20
30.2	36.41	48.03	30.2	31.07	5.56	30.3	51.71	39.18	30.3	52.33	63.36	30.3	25.99	20
31.2	36.23	47.90	31.2	30.71	5.47	31.2	51.55	39.15	31.3	52.00	63.51	31.3	25.81	20
32.2	36.07	47.75	32.2	30.36	5.37	32.2	51.40	39.08	32.3	51.66	63.67	32.3	25.64	20
8.32	-8.26		15.86	-15.83		7.02	-6.95		18.30	+18.27		7.63	-7.5	
21 ^h 38 ^m 29 ^s .050	22 ^h 16 ^m 20 ^s .949		22 ^h 37 ^m 45 ^s .323	23 ^h 27 ^m 43 ^s .851		23 ^h 47 ^m 20 ^s .1								
-83° 5' 50".66	-86° 23' 9".03		-81° 48' 43".57	+86° 51' 18".76		-82° 28' 28".								

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '
	0 57	+85 49		1 31	+88 52		1 41	-85 10		4 10	+85 20		5 36	+85 9
	s	"		s	"		s	"		s	"		s	"
0.3	39.48	44.52	0.4	74.59	38.29	0.4	63.40	56.32	0.5	59.35	31.01	0.5	10.25	27.36
1.3	39.31	44.77	1.4	74.06	38.58	1.4	63.17	56.54	1.5	59.41	31.32	1.5	10.40	27.63
2.3	39.14	45.03	2.4	73.52	38.87	2.4	62.94	56.74	2.5	59.47	31.64	2.5	10.55	27.89
3.3	38.97	45.29	3.4	72.95	39.17	3.4	62.71	56.93	3.5	59.54	31.96	3.5	10.70	28.17
4.3	38.78	45.56	4.4	72.33	39.48	4.4	62.49	57.10	4.5	59.60	32.32	4.5	10.86	28.48
5.3	38.56	45.82	5.4	71.66	39.78	5.4	62.28	57.25	5.5	59.65	32.68	5.5	11.01	28.79
6.3	38.33	46.07	6.4	70.92	40.09	6.4	62.08	57.40	6.5	59.68	33.04	6.5	11.15	29.13
7.3	38.08	46.32	7.4	70.10	40.38	7.4	61.88	57.55	7.5	59.69	33.40	7.5	11.27	29.48
8.3	37.83	46.55	8.3	69.24	40.66	8.4	61.69	57.72	8.5	59.69	33.77	8.5	11.38	29.82
9.3	37.57	46.75	9.3	68.36	40.90	9.4	61.49	57.89	9.5	59.66	34.12	9.5	11.46	30.16
10.3	37.30	46.94	10.3	67.50	41.13	10.4	61.27	58.08	10.5	59.63	34.46	10.5	11.52	30.49
11.3	37.06	47.10	11.3	66.68	41.34	11.4	61.04	58.28	11.5	59.59	34.75	11.5	11.58	30.79
12.3	36.83	47.27	12.3	65.92	41.54	12.3	60.79	58.46	12.4	59.56	35.04	12.5	11.65	31.07
13.3	36.63	47.45	13.3	65.22	41.76	13.3	60.53	58.64	13.4	59.55	35.32	13.5	11.73	31.34
14.3	36.43	47.64	14.3	64.57	41.99	14.3	60.26	58.79	14.4	59.56	35.61	14.5	11.81	31.60
15.3	36.23	47.82	15.3	63.90	42.22	15.3	59.99	58.94	15.4	59.58	35.92	15.5	11.92	31.87
16.3	36.01	48.01	16.3	63.19	42.47	16.3	59.71	59.05	16.4	59.59	36.24	16.5	12.03	32.17
17.3	35.78	48.23	17.3	62.42	42.72	17.3	59.45	59.14	17.4	59.60	36.58	17.5	12.14	32.49
18.3	35.54	48.44	18.3	61.57	42.98	18.3	59.20	59.21	18.4	59.59	36.92	18.5	12.24	32.83
19.3	35.27	48.64	19.3	60.64	43.23	19.3	58.97	59.28	19.4	59.56	37.28	19.5	12.31	33.19
20.3	34.98	48.80	20.3	59.64	43.47	20.3	58.74	59.36	20.4	59.52	37.64	20.5	12.37	33.55
21.3	34.69	48.95	21.3	58.61	43.67	21.3	58.51	59.44	21.4	59.43	37.98	21.5	12.41	33.89
22.3	34.39	49.08	22.3	57.57	43.86	22.3	58.29	59.55	22.4	59.34	38.29	22.5	12.42	34.23
23.3	34.10	49.19	23.3	56.56	44.01	23.3	58.05	59.67	23.4	59.24	38.58	23.5	12.43	34.55
24.3	33.81	49.29	24.3	55.57	44.16	24.3	57.79	59.79	24.4	59.14	38.87	24.5	12.42	34.86
25.3	33.56	49.37	25.3	54.63	44.29	25.3	57.52	59.90	25.4	59.04	39.14	25.5	12.42	35.15
26.3	33.31	49.45	26.3	53.72	44.43	26.3	57.24	60.00	26.4	58.95	39.41	26.5	12.41	35.44
27.3	33.06	49.53	27.3	52.82	44.56	27.3	56.95	60.10	27.4	58.86	39.68	27.5	12.42	35.73
28.3	32.81	49.62	28.3	51.95	44.70	28.3	56.67	60.17	28.4	58.78	39.95	28.5	12.43	36.02
29.3	32.57	49.70	29.3	51.07	44.84	29.3	56.38	60.23	29.4	58.71	40.22	29.5	12.44	36.31
30.3	32.32	49.80	30.3	50.18	44.98	30.3	56.09	60.27	30.4	58.65	40.49	30.5	12.46	36.61
31.3	32.06	49.91	31.3	49.26	45.14	31.3	55.81	60.28	31.4	58.57	40.77	31.5	12.48	36.92
13.75	+13.72		51.09	+51.08		11.91	-11.87		12.32	+12.28		11.85	+11.81	
0 ^h 57 ^m 16 ^s .959			1 ^h 30 ^m 42 ^s .307			1 ^h 41 ^m 58 ^s .587			4 ^h 10 ^m 20 ^s .187			5 ^h 35 ^m 31 ^s .554		
+85° 49' 4'''.72			+88° 52' 2'''.06			-85° 11' 3'''.34			+85° 20' 19'''.62			+85° 9' 32'''.39		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensse. Mag. 6.2			ζ Mensse. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m s	° ' "	Dec.	h m s	° ' "	Dec.	h m s	° ' "	Dec.	h m s	° ' "	Dec.	h m s	° ' "
	5 46	-84 49		6 46	-80 43		7 3	+87 10		7 14	+82 34		7 15	-86 54
0.5	3.02	40.95	0.6	54.94	38.97	0.6	29.93	28.07	0.6	18.42	0.93	0.6	55.82	11.13
1.5	3.07	41.33	1.6	54.99	39.34	1.6	30.30	28.26	1.6	18.58	1.10	1.6	56.05	11.46
2.5	3.10	41.70	2.6	55.05	39.70	2.6	30.67	28.45	2.6	18.73	1.26	2.6	56.25	11.80
3.5	3.12	42.07	3.6	55.11	40.05	3.6	31.06	28.66	3.6	18.90	1.44	3.6	56.43	12.13
4.5	3.13	42.41	4.6	55.16	40.39	4.6	31.46	28.88	4.6	19.07	1.63	4.6	56.61	12.45
5.5	3.14	42.74	5.6	55.21	40.72	5.6	31.86	29.11	5.6	19.23	1.84	5.6	56.75	12.76
6.5	3.14	43.06	6.6	55.25	41.04	6.6	32.24	29.38	6.6	19.38	2.07	6.6	56.89	13.05
7.5	3.15	43.37	7.6	55.30	41.36	7.6	32.61	29.65	7.6	19.53	2.31	7.6	57.05	13.34
8.5	3.16	43.68	8.6	55.34	41.67	8.6	32.94	29.93	8.6	19.68	2.58	8.6	57.21	13.63
9.5	3.18	44.01	9.6	55.40	41.98	9.6	33.23	30.21	9.6	19.81	2.84	9.6	57.38	13.92
10.5	3.20	44.34	10.6	55.44	42.31	10.6	33.51	30.48	10.6	19.91	3.09	10.6	57.57	14.22
11.5	3.22	44.70	11.6	55.49	42.66	11.6	33.75	30.73	11.6	20.02	3.33	11.6	57.76	14.54
12.5	3.23	45.08	12.6	55.54	43.03	12.6	34.01	30.96	12.6	20.13	3.55	12.6	57.94	14.80
13.5	3.22	45.47	13.6	55.58	43.43	13.6	34.27	31.19	13.6	20.24	3.77	13.6	58.09	15.26
14.5	3.19	45.86	14.6	55.61	43.83	14.6	34.55	31.41	14.6	20.36	3.96	14.6	58.23	15.64
15.5	3.15	46.25	15.5	55.64	44.24	15.6	34.86	31.64	15.6	20.49	4.15	15.6	58.33	16.03
16.5	3.10	46.62	16.5	55.65	44.62	16.6	35.18	31.88	16.6	20.62	4.36	16.6	58.41	16.41
17.5	3.04	46.98	17.5	55.66	45.00	17.6	35.51	32.14	17.6	20.77	4.58	17.6	58.46	16.77
18.5	2.98	47.31	18.5	55.67	45.34	18.6	35.83	32.41	18.6	20.91	4.85	18.6	58.50	17.11
19.5	2.92	47.64	19.5	55.68	45.68	19.5	36.13	32.71	19.6	21.04	5.12	19.6	58.55	17.44
20.5	2.87	47.95	20.5	55.69	46.01	20.5	36.39	33.03	20.6	21.16	5.42	20.6	58.60	17.75
21.5	2.82	48.26	21.5	55.70	46.35	21.5	36.62	33.35	21.6	21.26	5.71	21.6	58.68	18.05
22.5	2.79	48.58	22.5	55.72	46.68	22.5	36.81	33.66	22.5	21.35	6.01	22.6	58.76	18.36
23.5	2.75	48.92	23.5	55.73	47.03	23.5	36.99	33.98	23.5	21.43	6.30	23.5	58.85	18.69
24.5	2.70	49.27	24.5	55.75	47.39	24.5	37.14	34.28	24.5	21.49	6.58	24.5	58.93	19.05
25.5	2.65	49.63	25.5	55.76	47.75	25.5	37.28	34.56	25.5	21.55	6.84	25.5	59.01	19.41
26.5	2.57	49.99	26.5	55.77	48.14	26.5	37.42	34.83	26.5	21.63	7.09	26.5	59.07	19.79
27.5	2.50	50.36	27.5	55.78	48.55	27.5	37.57	35.11	27.5	21.70	7.33	27.5	59.13	20.17
28.5	2.42	50.73	28.5	55.77	48.95	28.5	37.74	35.38	28.5	21.77	7.58	28.5	59.17	20.56
29.5	2.33	51.10	29.5	55.76	49.35	29.5	37.91	35.65	29.5	21.85	7.84	29.5	59.17	20.95
30.5	2.23	51.46	30.5	55.75	49.74	30.5	38.09	35.93	30.5	21.92	8.11	30.5	59.15	21.33
31.5	2.10	51.80	31.5	55.72	50.12	31.5	38.28	36.22	31.5	22.01	8.37	31.5	59.12	21.71
11.10	-11.05		6.21	-6.13		20.29	+20.27		7.73	+7.67		18.52	-18.49	
5 ^h 46 ^m	3°.075		6 ^h 46 ^m	53°.600		7 ^h 2 ^m	33°.206		7 ^h 13 ^m	55°.106		7 ^h 16 ^m	0°.004	
-84° 49'	45'' 59		-80° 43'	42'' 15		+87° 10'	49'' 32		+82° 34'	23'' 73		-86° 54'	13'' 24	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m s	° ' "	Dec.	h m s	° ' "	Dec.	h m s	° ' "	Dec.	h m s	° ' "	Dec.	h m s	° ' "
	8 18	+88 52		9 8	-85 20		9 25	+81 40		9 36	-80 34		10 21	+82 57
0.7	34.78	16.38	0.7	48.06	13.25	0.7	43.14	46.22	0.7	21.91	24.95	0.7	21.09	52.71
1.6	35.84	16.48	1.7	48.32	13.47	1.7	43.31	46.20	1.7	22.05	25.13	1.7	21.27	52.62
2.6	36.94	16.57	2.7	48.56	13.69	2.7	43.48	46.18	2.7	22.19	25.32	2.7	21.47	52.52
3.6	38.08	16.67	3.7	48.80	13.92	3.7	43.66	46.16	3.7	22.33	25.53	3.7	21.66	52.42
4.6	39.24	16.80	4.7	49.03	14.15	4.7	43.83	46.17	4.7	22.46	25.74	4.7	21.88	52.34
5.6	40.45	16.93	5.7	49.23	14.37	5.7	44.02	46.20	5.7	22.58	25.93	5.7	22.10	52.28
6.6	41.62	17.09	6.7	49.44	14.57	6.7	44.21	46.24	6.7	22.70	26.13	6.7	22.32	52.22
7.6	42.77	17.27	7.7	49.64	14.78	7.7	44.39	46.31	7.7	22.81	26.31	7.7	22.53	52.18
8.6	43.86	17.47	8.7	49.85	14.96	8.7	44.57	46.39	8.7	22.92	26.50	8.7	22.75	52.17
9.6	44.87	17.67	9.7	50.07	15.15	9.7	44.74	46.47	9.7	23.04	26.67	9.7	22.95	52.18
10.6	45.81	17.86	10.7	50.29	15.37	10.7	44.88	46.55	10.7	23.17	26.85	10.7	23.13	52.20
11.6	46.68	18.05	11.7	50.53	15.59	11.7	45.02	46.63	11.7	23.30	27.05	11.7	23.31	52.21
12.6	47.53	18.23	12.7	50.76	15.84	12.7	45.16	46.71	12.7	23.43	27.28	12.7	23.49	52.21
13.6	48.39	18.38	13.7	51.00	16.11	13.7	45.31	46.76	13.7	23.56	27.54	13.7	23.66	52.21
14.6	49.29	18.53	14.6	51.23	16.43	14.7	45.46	46.81	14.7	23.70	27.81	14.7	23.84	52.17
15.6	50.25	18.67	15.6	51.44	16.74	15.7	45.60	46.85	15.7	23.83	28.10	15.7	24.02	52.13
16.6	51.26	18.84	16.6	51.64	17.05	16.7	45.78	46.89	16.7	23.94	28.39	16.7	24.21	52.12
17.6	52.31	19.02	17.6	51.82	17.34	17.7	45.96	46.96	17.7	24.05	28.67	17.7	24.43	52.10
18.6	53.36	19.21	18.6	51.97	17.64	18.7	46.14	47.04	18.7	24.15	28.95	18.7	24.65	52.10
19.6	54.38	19.44	19.6	52.13	17.93	19.6	46.31	47.16	19.7	24.25	29.23	19.7	24.87	52.14
20.6	55.34	19.69	20.6	52.30	18.19	20.6	46.49	47.29	20.7	24.35	29.48	20.7	25.07	52.19
21.6	56.24	19.95	21.6	52.46	18.45	21.6	46.64	47.44	21.6	24.45	29.71	21.7	25.27	52.28
22.6	57.04	20.21	22.6	52.63	18.71	22.6	46.78	47.61	22.6	24.55	29.95	22.7	25.46	52.37
23.6	57.76	20.47	23.6	52.80	18.97	23.6	46.92	47.76	23.6	24.65	30.22	23.7	25.65	52.45
24.6	58.44	20.71	24.6	52.99	19.24	24.6	47.05	47.91	24.6	24.75	30.49	24.7	25.81	52.54
25.6	59.10	20.95	25.6	53.17	19.55	25.6	47.17	48.07	25.6	24.86	30.76	25.7	25.98	52.63
26.6	59.75	21.18	26.6	53.36	19.86	26.6	47.29	48.22	26.6	24.97	31.04	26.7	26.14	52.73
27.6	60.39	21.41	27.6	53.55	20.19	27.6	47.41	48.36	27.6	25.08	31.35	27.7	26.30	52.81
28.6	61.07	21.63	28.6	53.72	20.53	28.6	47.54	48.51	28.6	25.19	31.68	28.7	26.46	52.89
29.6	61.76	21.85	29.6	53.86	20.88	29.6	47.67	48.65	29.6	25.29	32.01	29.7	26.63	52.96
30.6	62.49	22.08	30.6	54.00	21.24	30.6	47.80	48.78	30.6	25.39	32.37	30.7	26.81	53.04
31.6	63.23	22.31	31.6	54.14	21.59	31.6	47.94	48.92	31.6	25.48	32.71	31.7	26.98	53.12
50.79	+50.78		12.30	-12.26		6.91	+6.84		6.11	-6.02		8.16	+8.10	
8 ^h 16 ^m	48°.125		9 ^h 8 ^m	49°.775		9 ^h 25 ^m	30°.501		9 ^h 36 ^m	20°.688		10 ^h 21 ^m	12°.394	
+88° 52'	49''.08		-85° 20'	12''.12		+81° 41'	25''.82		-80° 34'	23''.04		+82° 58'	35''.87	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			4 Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "
0.8	10 59	-84 9	0.8	12 14	+88 8	0.8	12 46	-84 40	0.8	12 48	+83 50	0.9	13 27	-85 22
1.8	55.24	14.04	0.8	6.57	33.46	0.8	14.96	47.86	0.8	22.93	50.79	0.9	26.13	7.21
2.8	55.49	14.09	1.8	7.08	33.24	1.8	15.23	47.73	1.8	23.07	50.52	1.9	26.41	7.03
3.8	55.74	14.16	2.8	7.61	33.00	2.8	15.48	47.64	2.8	23.22	50.25	2.9	26.69	6.87
4.8	55.98	14.24	3.8	8.17	32.76	3.8	15.73	47.58	3.8	23.39	49.97	3.9	26.96	6.73
5.8	56.21	14.33	4.8	8.77	32.53	4.8	15.97	47.52	4.8	23.56	49.69	4.9	27.22	6.61
6.7	56.42	14.41	5.8	9.42	32.30	5.8	16.21	47.46	5.8	23.74	49.41	5.9	27.48	6.49
7.7	56.63	14.49	6.8	10.10	32.10	6.8	16.45	47.40	6.8	23.93	49.14	6.9	27.72	6.37
8.7	56.84	14.58	7.8	10.79	31.91	7.8	16.67	47.32	7.8	24.12	48.90	7.8	27.95	6.25
9.7	57.04	14.64	8.8	11.48	31.73	8.8	16.88	47.25	8.8	24.32	48.67	8.8	28.19	6.13
10.7	57.25	14.70	9.8	12.16	31.59	9.8	17.10	47.16	9.8	24.51	48.47	9.8	28.42	6.00
11.7	57.47	14.75	10.8	12.81	31.45	10.8	17.33	47.08	10.8	24.70	48.28	10.8	28.67	5.85
12.7	57.71	14.84	11.8	13.41	31.33	11.8	17.60	46.99	11.8	24.88	48.09	11.8	28.94	5.71
13.7	57.95	14.93	12.8	13.98	31.21	12.8	17.86	46.93	12.8	25.05	47.91	12.8	29.22	5.56
14.7	58.20	15.05	13.8	14.54	31.07	13.8	18.14	46.88	13.8	25.21	47.71	13.8	29.53	5.43
15.7	58.45	15.19	14.8	15.08	30.90	14.8	18.43	46.84	14.8	25.37	47.51	14.8	29.85	5.34
16.7	58.69	15.35	15.8	15.66	30.72	15.8	18.72	46.83	15.8	25.54	47.30	15.8	30.17	5.26
17.7	58.93	15.53	16.8	16.27	30.56	16.8	19.00	46.85	16.8	25.71	47.08	16.8	30.50	5.21
18.7	59.15	15.72	17.8	16.94	30.39	17.8	19.27	46.88	17.8	25.91	46.86	17.8	30.79	5.17
19.7	59.35	15.90	18.8	17.64	30.22	18.8	19.52	46.91	18.8	26.12	46.65	18.8	31.08	5.14
20.7	59.55	16.09	19.8	18.38	30.08	19.8	19.76	46.93	19.8	26.34	46.45	19.8	31.35	5.10
21.7	59.74	16.26	20.8	19.13	29.98	20.8	20.00	46.96	20.8	26.57	46.26	20.8	31.61	5.07
22.7	59.94	16.40	21.8	19.88	29.90	21.8	20.24	46.96	21.8	26.78	46.12	21.8	31.88	5.02
23.7	60.13	16.53	22.8	20.59	29.82	22.8	20.47	46.96	22.8	27.00	45.99	22.8	32.14	4.96
24.7	60.35	16.67	23.8	21.28	29.77	23.8	20.71	46.95	23.8	27.19	45.89	23.8	32.41	4.89
25.7	60.56	16.81	24.8	21.93	29.73	24.8	20.97	46.95	24.8	27.39	45.78	24.8	32.69	4.83
26.7	60.78	16.98	25.7	22.57	29.69	25.8	21.25	46.94	25.8	27.59	45.69	25.8	33.00	4.76
27.7	61.00	17.17	26.7	23.18	29.64	26.8	21.52	46.95	26.8	27.77	45.59	26.8	33.30	4.71
28.7	61.21	17.38	27.7	23.80	29.59	27.8	21.80	46.98	27.8	27.95	45.49	27.8	33.62	4.67
29.7	61.46	17.60	28.7	24.41	29.54	28.8	22.09	47.04	28.8	28.14	45.36	28.8	33.95	4.66
30.7	61.67	17.82	29.7	25.02	29.48	29.8	22.37	47.11	29.8	28.32	45.25	29.8	34.28	4.65
31.7	61.89	18.06	30.7	25.67	29.42	30.8	22.65	47.20	30.8	28.52	45.12	30.8	34.61	4.66
32.7	62.08	18.31	31.7	26.35	29.34	31.8	22.92	47.30	31.8	28.74	45.00	31.8	34.92	4.70
9.82	-9.77		30.84	+30.82		10.78	-10.74		9.33	+9.27		12.38	-12.34	
10 ^h 59 ^m	54 ^s .915		12 ^h 14 ^m	28 ^s .804		12 ^h 46 ^m	13 ^s .131		12 ^h 48 ^m	30 ^s .862		13 ^h 27 ^m	23 ^s .749	
-84° 9'	9''.97		+88° 9'	16''.14		-84° 40'	41''.95		+83° 51'	30''.88		-85° 22'	0''.86	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursa Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "
	14 13	-83 17		15 2	+87 32		15 24	-84 11		16 54	+82 10		17 16	-80 47
	s	"		s	"		s	"		s	"		s	"
0.9	40.60	44.19	0.9	26.32	33.37	0.9	14.94	48.99	1.0	1.29	24.55	1.0	11.63	14.73
1.9	40.76	43.96	1.9	26.38	33.04	1.9	15.06	48.70	2.0	1.23	24.23	2.0	11.64	14.38
2.9	40.93	43.76	2.9	26.45	32.71	2.9	15.22	48.41	3.0	1.19	23.89	3.0	11.67	14.05
3.9	41.10	43.56	3.9	26.54	32.35	3.9	15.36	48.13	4.0	1.15	23.54	4.0	11.71	13.73
4.9	41.27	43.40	4.9	26.66	31.99	4.9	15.51	47.89	4.9	1.11	23.18	5.0	11.75	13.44
5.9	41.44	43.24	5.9	26.79	31.61	5.9	15.65	47.65	5.9	1.07	22.81	6.0	11.78	13.16
6.9	41.59	43.09	6.9	26.96	31.23	6.9	15.78	47.42	6.9	1.04	22.43	7.0	11.81	12.88
7.9	41.74	42.92	7.9	27.14	30.85	7.9	15.92	47.19	7.9	1.03	22.05	8.0	11.84	12.60
8.9	41.89	42.74	8.9	27.38	30.50	8.9	16.04	46.96	8.9	1.02	21.66	9.0	11.85	12.34
9.9	42.03	42.57	9.9	27.61	30.17	9.9	16.16	46.70	9.9	1.00	21.28	10.0	11.86	12.07
10.9	42.18	42.37	10.9	27.84	29.87	10.9	16.28	46.43	10.9	1.01	20.94	10.9	11.88	11.75
11.9	42.35	42.16	11.9	28.06	29.58	11.9	16.41	46.16	11.9	1.01	20.61	11.9	11.91	11.42
12.9	42.53	41.95	12.9	28.25	29.30	12.9	16.58	45.87	12.9	1.01	20.29	12.9	11.94	11.08
13.9	42.72	41.76	13.9	28.43	29.01	13.9	16.75	45.60	13.9	1.00	19.99	13.9	11.98	10.72
14.9	42.94	41.59	14.9	28.69	28.71	14.9	16.93	45.34	14.9	1.00	19.67	14.9	12.04	10.37
15.9	43.15	41.45	15.9	28.75	28.40	15.9	17.13	45.10	15.9	0.99	19.34	15.9	12.12	10.04
16.9	43.36	41.34	16.9	28.92	28.07	16.9	17.33	44.83	16.9	0.98	18.98	16.9	12.20	9.74
17.9	43.57	41.24	17.9	29.13	27.74	17.9	17.54	44.69	17.9	0.98	18.62	17.9	12.28	9.45
18.9	43.76	41.16	18.9	29.38	27.40	18.9	17.74	44.51	18.9	0.97	18.23	18.9	12.36	9.18
19.8	43.94	41.08	19.9	29.66	27.06	19.9	17.92	44.33	19.9	0.98	17.85	19.9	12.42	8.93
20.8	44.12	40.98	20.9	29.98	26.74	20.9	18.08	44.16	20.9	1.01	17.47	20.9	12.48	8.67
21.8	44.29	40.88	21.9	30.31	26.43	21.9	18.24	43.96	21.9	1.03	17.09	21.9	12.53	8.40
22.8	44.47	40.76	22.9	30.66	26.15	22.9	18.40	43.76	22.9	1.06	16.71	22.9	12.58	8.11
23.8	44.64	40.64	23.9	30.99	25.88	23.9	18.58	43.54	23.9	1.10	16.37	23.9	12.63	7.82
24.8	44.82	40.51	24.9	31.32	25.64	24.9	18.76	43.32	24.9	1.13	16.03	24.9	12.68	7.51
25.8	45.01	40.38	25.9	31.64	25.40	25.9	18.94	43.10	25.9	1.17	15.71	25.9	12.74	7.20
26.8	45.23	40.25	26.9	31.96	25.17	26.9	19.14	42.88	26.9	1.22	15.38	26.9	12.82	6.88
27.8	45.44	40.15	27.9	32.24	24.93	27.9	19.35	42.67	27.9	1.26	15.06	27.9	12.90	6.57
28.8	45.67	40.06	28.9	32.55	24.69	28.9	19.57	42.48	28.9	1.31	14.77	28.9	12.98	6.27
29.8	45.89	39.99	29.9	32.85	24.44	29.9	19.80	42.31	29.9	1.35	14.47	29.9	13.08	5.98
30.8	46.12	39.95	30.9	33.16	24.18	30.9	20.03	42.16	30.9	1.39	14.16	30.9	13.18	5.69
31.8	46.34	39.91	31.8	33.48	23.92	31.9	20.27	42.02	31.9	1.43	13.83	31.9	13.29	5.42
8.57	-8.51		23.31	+23.29		9.89	-9.84		7.34	+7.27		6.25	-6.17	
14 ^h 13 ^m	37 ^s .066		15 ^h 3 ^m	21 ^s .809		15 ^h 24 ^m	9 ^s .966		16 ^h 54 ^m	19 ^s .238		17 ^h 16 ^m	6 ^s .064	
-83° 17'	37''.78		+87° 32'	56''.60		-84° 11'	42''.92		+82° 10'	27''.09		-80° 47'	10''.43	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			γ Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Dec.	h m ° ' "		Dec.	h m ° ' "		Dec.	h m ° ' "		Dec.	h m ° ' "		Dec.	h m ° ' "	
	17 57 +86 36			18 6 -87 39			18 58 +89 1			19 29 -89 13			20 48 +82 14	
	s " "			s " "			s " "			s " "			s " "	
1.1	56.32 60.81	1.1	60.36 54.97	1.1	56.61 28.39	1.1	52.37 22.42	1.2	27.45 20.12					
2.1	56.09 60.54	2.1	60.26 54.62	2.1	55.60 28.19	2.1	51.47 22.10	2.2	27.30 20.06					
3.0	55.87 60.27	3.1	60.20 54.27	3.1	54.56 27.97	3.1	50.66 21.78	3.2	27.14 19.97					
4.0	55.65 59.98	4.1	60.16 53.95	4.1	53.49 27.75	4.1	49.95 21.47	4.2	26.99 19.89					
5.0	55.43 59.66	5.1	60.16 53.62	5.1	52.41 27.50	5.1	49.30 21.18	5.2	26.82 19.78					
6.0	55.23 59.33	6.0	60.14 53.33	6.1	51.33 27.23	6.1	48.70 20.88	6.2	26.66 19.65					
7.0	55.04 58.99	7.0	60.11 53.03	7.1	50.31 26.95	7.1	48.10 20.60	7.2	26.50 19.51					
8.0	54.87 58.63	8.0	60.08 52.73	8.1	49.36 26.66	8.1	47.46 20.33	8.2	26.33 19.34					
9.0	54.73 58.27	9.0	60.01 52.44	9.1	48.51 26.37	9.1	46.75 20.07	9.2	26.18 19.16					
10.0	54.59 57.94	10.0	59.93 52.13	10.1	47.74 26.08	10.1	45.98 19.81	10.1	26.03 18.99					
11.0	54.49 57.61	11.0	59.87 51.81	11.1	47.03 25.79	11.1	45.18 19.50	11.1	25.90 18.81					
12.0	54.39 57.32	12.0	59.81 51.45	12.1	46.36 25.52	12.1	44.38 19.19	12.1	25.77 18.64					
13.0	54.26 57.03	13.0	59.78 51.08	13.1	45.68 25.29	13.1	43.62 18.84	13.1	25.64 18.48					
14.0	54.13 56.76	14.0	59.79 50.70	14.1	44.96 25.06	14.1	42.97 18.47	14.1	25.52 18.34					
15.0	54.00 56.48	15.0	59.85 50.33	15.1	44.18 24.83	15.1	42.46 18.11	15.1	25.39 18.22					
16.0	53.86 56.17	16.0	59.95 49.96	16.1	43.35 24.59	16.1	42.09 17.73	16.1	25.26 18.10					
17.0	53.70 55.86	17.0	60.09 49.62	17.1	42.50 24.33	17.1	41.83 17.37	17.1	25.12 17.95					
18.0	53.56 55.53	18.0	60.23 49.28	18.1	41.64 24.04	18.1	41.62 17.03	18.1	24.98 17.77					
19.0	53.45 55.16	19.0	60.38 48.97	19.0	40.82 23.72	19.1	41.42 16.71	19.1	24.83 17.58					
20.0	53.35 54.79	20.0	60.48 48.68	20.0	40.09 23.40	20.1	41.20 16.42	20.1	24.69 17.36					
21.0	53.27 54.42	21.0	60.57 48.38	21.0	39.44 23.08	21.1	40.93 16.12	21.1	24.55 17.13					
21.9	53.22 54.04	22.0	60.66 48.07	22.0	38.89 22.74	22.1	40.57 15.81	22.1	24.41 16.88					
22.9	53.18 53.70	23.0	60.71 47.76	23.0	38.41 22.40	23.1	40.17 15.50	23.1	24.30 16.64					
23.9	53.17 53.37	23.9	60.79 47.42	24.0	37.99 22.08	24.1	39.75 15.17	24.1	24.19 16.39					
24.9	53.15 53.03	24.9	60.86 47.07	25.0	37.62 21.79	25.1	39.34 14.84	25.1	24.08 16.15					
25.9	53.14 52.71	25.9	60.94 46.71	26.0	37.26 21.50	26.0	38.97 14.49	26.1	23.98 15.92					
26.9	53.12 52.40	26.9	61.07 46.35	27.0	36.89 21.22	27.0	38.66 14.13	27.1	23.89 15.69					
27.9	53.11 52.09	27.9	61.23 45.99	28.0	36.51 20.95	28.0	38.43 13.76	28.1	23.79 15.47					
28.9	53.08 51.80	28.9	61.40 45.63	29.0	36.09 20.67	29.0	38.30 13.38	29.1	23.69 15.27					
29.9	53.05 51.49	29.9	61.62 45.27	30.0	35.65 20.38	30.0	38.27 13.01	30.1	23.58 15.06					
30.9	53.03 51.18	30.9	61.87 44.93	31.0	35.20 20.07	31.0	38.34 12.64	31.1	23.48 14.84					
31.9	53.00 50.84	31.9	62.14 44.60	32.0	34.74 19.75	32.0	38.48 12.28	32.1	23.38 14.61					
16.94	+16.91	24.53	-24.51	58.68	+58.68	73.62	-73.61	7.40	+7.34					
17 ^h 58 ^m 41 ^s .809		18 ^h 6 ^m 47 ^s .620		19 ^h 1 ^m 27 ^s .463		19 ^h 29 ^m 16 ^s .746		20 ^h 48 ^m 36 ^s .323						
+86° 36' 51".12		-87° 39' 51".38		+89° 1' 7".53		-89° 13' 21".02		+82° 13' 43".34						

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			δ H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "
	21 38	-83 5		22 16	-86 23		22 37	-81 48		23 27	+86 52		23 47	-82 28
	s	"		s	"		s	"		s	"		s	"
1.2	36.23	47.90	1.2	30.71	5.47	1.2	51.55	39.15	1.3	52.00	3.51	1.3	25.81	22.66
2.2	36.07	47.75	2.2	30.36	5.37	2.2	51.40	39.08	2.3	51.66	3.67	2.3	25.64	22.71
3.2	35.92	47.59	3.2	30.01	5.26	3.2	51.26	39.00	3.3	51.31	3.83	3.3	25.48	22.73
4.2	35.77	47.41	4.2	29.70	5.14	4.2	51.12	38.92	4.3	50.94	3.98	4.3	25.33	22.74
5.2	35.63	47.26	5.2	29.40	5.02	5.2	50.99	38.85	5.3	50.54	4.12	5.3	25.18	22.75
6.2	35.50	47.11	6.2	29.12	4.90	6.2	50.87	38.76	6.3	50.13	4.26	6.3	25.02	22.76
7.2	35.38	46.97	7.2	28.84	4.79	7.2	50.74	38.69	7.3	49.71	4.38	7.3	24.88	22.78
8.2	35.25	46.83	8.2	28.56	4.68	8.2	50.62	38.62	8.3	49.27	4.40	8.3	24.74	22.81
9.2	35.11	46.69	9.2	28.25	4.58	9.2	50.49	38.57	9.3	48.83	4.57	9.3	24.59	22.85
10.2	34.95	46.55	10.2	27.94	4.49	10.2	50.35	38.51	10.3	48.44	4.63	10.3	24.43	22.89
11.2	34.78	46.39	11.2	27.60	4.38	11.2	50.20	38.45	11.3	48.05	4.69	11.3	24.26	22.92
12.2	34.61	46.22	12.2	27.25	4.26	12.2	50.04	38.37	12.3	47.69	4.75	12.3	24.08	22.93
13.2	34.45	46.04	13.2	26.91	4.10	13.2	49.88	38.27	13.3	47.35	4.82	13.3	23.89	22.94
14.2	34.30	45.82	14.2	26.55	3.92	14.2	49.73	38.14	14.2	47.01	4.89	14.3	23.71	22.91
15.2	34.15	45.58	15.2	26.21	3.71	15.2	49.58	37.99	15.2	46.66	4.98	15.3	23.53	22.86
16.2	34.02	45.32	16.2	25.91	3.49	16.2	49.44	37.82	16.2	46.30	5.08	16.3	23.36	22.79
17.2	33.91	45.07	17.2	25.63	3.27	17.2	49.32	37.64	17.2	45.92	5.17	17.3	23.21	22.71
18.2	33.80	44.84	18.2	25.38	3.06	18.2	49.21	37.46	18.2	45.51	5.26	18.3	23.07	22.63
19.2	33.70	44.60	19.2	25.13	2.87	19.2	49.10	37.30	19.2	45.08	5.33	19.2	22.93	22.56
20.2	33.60	44.37	20.2	24.89	2.68	20.2	49.00	37.15	20.2	44.65	5.37	20.2	22.79	22.48
21.2	33.50	44.17	21.2	24.64	2.51	21.2	48.88	37.01	21.2	44.20	5.38	21.2	22.64	22.43
22.2	33.38	43.97	22.2	24.38	2.34	22.2	48.76	36.88	22.2	43.77	5.37	22.2	22.49	22.38
23.1	33.25	43.78	23.2	24.10	2.16	23.2	48.63	36.75	23.2	43.35	5.35	23.2	22.33	22.34
24.1	33.12	43.57	24.2	23.80	1.98	24.2	48.49	36.60	24.2	42.96	5.32	24.2	22.17	22.29
25.1	32.99	43.34	25.2	23.50	1.80	25.2	48.36	36.44	25.2	42.58	5.28	25.2	22.00	22.23
26.1	32.85	43.08	26.2	23.19	1.59	26.2	48.22	36.27	26.2	42.22	5.24	26.2	21.82	22.16
27.1	32.72	42.82	27.2	22.88	1.36	27.2	48.08	36.08	27.2	41.87	5.21	27.2	21.64	22.08
28.1	32.60	42.55	28.2	22.59	1.12	28.2	47.94	35.88	28.2	41.52	5.20	28.2	21.47	21.97
29.1	32.49	42.26	29.2	22.31	0.87	29.2	47.81	35.66	29.2	41.16	5.19	29.2	21.30	21.84
30.1	32.38	41.96	30.2	22.05	0.60	30.2	47.69	35.44	30.2	40.80	5.18	30.2	21.14	21.72
31.1	32.29	41.66	31.2	21.81	0.32	31.2	47.59	35.20	31.2	40.42	5.17	31.2	20.98	21.57
32.1	32.20	41.36	32.1	21.59	0.03	32.2	47.50	34.96	32.2	40.04	5.16	32.2	20.84	21.41
8.32 -8.26			15.86 -15.82			7.02 -6.95			18.30 +18.28			7.63 -7.57		
21 ^h 38 ^m 29 ^s .050			22 ^h 16 ^m 20 ^s .949			22 ^h 37 ^m 45 ^s .323			23 ^h 27 ^m 43 ^s .851			23 ^h 47 ^m 20 ^s .032		
-83° 5' 50".66			-86° 23' 9".03			-81° 48' 43".57			+86° 51' 18".76			-82° 28' 28".42		

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	33 Piscium. Mag. 4.7		α Andromedæ. (Alpheratz.) Mag. 2.2		β Cassiopeiæ. Mag. 2.4		ϵ Phœnicis. Mag. 3.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 1	° ' " - 6 9	h m 0 4	° ' " +28 38	h m 0 4	° ' " +58 41	h m 0 5	° ' " -46 11
Jan. 0.2	9.195	55.15	9.619	31.36	48.386	74.72	15.927	68.43
10.2	9.089 ¹⁰⁶	55.73 ⁵⁸	9.483 ¹³⁶	30.44 ⁹²	48.083 ³⁰³	73.98 ⁷⁴	15.725 ²⁰²	68.07 ²
20.2	8.991 ⁹⁸	56.19 ⁴⁶	9.354 ¹²⁹	29.25 ¹¹⁹	47.791 ²⁹²	72.72 ¹²⁶	15.538 ¹⁸⁷	67.25 ⁸
30.1	8.904 ⁸⁷	56.51 ⁸⁷	9.237 ¹¹⁷	27.86 ¹³⁹	47.524 ²⁶⁷	70.99 ¹⁷³	15.373 ¹⁶⁵	65.99 ¹²
Feb. 9.1	8.833 ⁷¹	56.68 ¹⁷	9.138 ⁹⁹	26.32 ¹⁵⁴	47.295 ²²⁹	68.87 ²¹²	15.235 ¹³⁸	64.33 ¹⁶
	51	0	74	162	182	242	106	20
19.1	8.782	56.68	9.064	24.70	47.113	66.45	15.129	62.30
Mar. 1.1	8.757 ²⁵	56.47 ²¹	9.020 ⁴⁴	23.06 ¹⁶⁴	46.991 ¹²²	63.82 ²⁶³	15.061 ⁶⁸	59.96 ²¹
11.0	8.761 ⁴	56.07 ⁴⁰	9.014 ⁶	21.49 ¹⁵⁷	46.939 ⁵²	61.10 ²⁷²	15.035 ²⁶	57.34 ²⁴
21.0	8.800 ³⁹	55.42 ⁶⁵	9.049 ³⁵	20.07 ¹⁴²	46.961 ²²	58.39 ²⁷¹	15.055 ²⁰	54.51 ²⁸
31.0	8.875 ⁷⁵	54.54 ⁸⁸	9.129 ⁸⁰	18.87 ¹²⁰	47.063 ¹⁰²	55.83 ²⁵⁶	15.125 ⁷⁰	51.53 ²¹
	114	112	126	93	181	234	120	31
Apr. 10.0	8.989	53.42	9.255	17.94	47.244	53.49	15.245	48.43
19.9	9.142 ¹⁵³	52.07 ¹³⁵	9.427 ¹⁷²	17.35 ⁵⁹	47.501 ²⁵⁷	51.49 ²⁰⁰	15.417 ¹⁷²	45.30 ³
29.9	9.333 ¹⁹¹	50.50 ¹⁵⁷	9.644 ²¹⁷	17.13 ²²	47.830 ³²⁹	49.90 ¹⁵⁹	15.640 ²²³	42.20 ³
May 9.9	9.560 ²²⁷	48.75 ¹⁷⁵	9.901 ²⁵⁷	17.29 ¹⁶	48.221 ³⁹¹	48.78 ¹¹²	15.909 ²⁶⁹	39.21 ²
19.8	9.818 ²⁵⁸	46.86 ¹⁸⁹	10.191 ²⁹⁰	17.85 ⁵⁶	48.663 ⁴⁴²	48.15 ⁶³	16.221 ³¹²	36.36 ²
	282	201	318	93	482	9	348	2
29.8	10.100	44.85	10.509	18.78	49.145	48.06	16.569	33.75
June 8.8	10.402 ³⁰²	42.78 ²⁰⁷	10.845 ³³⁶	20.08 ¹³⁰	49.652 ⁵⁰⁷	48.49 ⁴³	16.944 ³⁷⁵	31.42 ²
18.8	10.714 ³¹²	40.71 ²⁰⁷	11.190 ³⁴⁵	21.71 ¹⁶³	50.171 ⁵¹⁹	49.45 ⁹⁶	17.337 ³⁹³	29.45 ¹
28.7	11.029 ³¹⁵	38.68 ²⁰³	11.537 ³⁴⁷	23.61 ¹⁹⁰	50.689 ⁵¹⁸	50.89 ¹⁴⁴	17.738 ⁴⁰¹	27.87 ¹
July 8.7	11.337 ³⁰⁸	36.75 ¹⁹³	11.875 ³³⁸	25.76 ²¹⁵	51.191 ⁵⁰²	52.77 ¹⁸⁸	18.135 ³⁹⁷	26.72 ¹
	295	178	322	231	475	230	385	
18.7	11.632	34.97	12.197	28.07	51.666	55.07	18.520	26.04
28.7	11.907 ²⁷⁵	33.39 ¹⁵⁸	12.494 ²⁹⁷	30.50 ²⁴³	52.104 ⁴³⁸	57.72 ²⁶⁵	18.879 ³⁵⁹	25.83 ¹
Aug. 7.6	12.154 ²⁴⁷	32.03 ¹³⁶	12.761 ²⁶⁷	33.00 ²⁵⁰	52.495 ³⁹¹	60.64 ²⁹²	19.206 ³²⁷	26.10
17.6	12.368 ²¹⁴	30.93 ¹¹⁰	12.994 ²³³	35.50 ²⁵⁰	52.832 ³³⁷	63.79 ³¹⁵	19.490 ²⁸⁴	26.84
27.6	12.546 ¹⁷⁸	30.11 ⁸²	13.186 ¹⁹²	37.96 ²⁴⁶	53.108 ²⁷⁶	67.09 ³³⁰	19.724 ²³⁴	28.02 ¹
	141	56	152	237	215	339	181	1
Sept. 6.5	12.687	29.55	13.338	40.33	53.323	70.48	19.905	29.58
16.5	12.787 ¹⁰⁰	29.27 ²⁸	13.449 ¹¹¹	42.56 ²²³	53.475 ¹⁵²	73.88 ³⁴⁰	20.029 ¹²⁴	31.46 ¹
26.5	12.849 ⁶²	29.23 ⁴	13.519 ⁷⁰	44.62 ²⁰⁶	53.561 ⁸⁶	77.23 ³³⁵	20.096 ⁶⁷	33.59 ¹
Oct. 6.5	12.876 ²⁷	29.44 ²¹	13.551 ³²	46.47 ¹⁸⁵	53.586 ²⁵	80.46 ³²³	20.106 ¹⁰	35.88 ¹
16.4	12.868 ⁸	29.83 ³⁹	13.548 ³	48.08 ¹⁶¹	53.551 ³⁵	83.49 ³⁰³	20.064 ⁴²	38.23 ¹
	35	55	36	137	90	279	90	1
26.4	12.833	30.38	13.512	49.45	53.461	86.28	19.974	40.54
Nov. 5.4	12.773 ⁶⁰	31.07 ⁶⁹	13.449 ⁶³	50.53 ¹⁰⁸	53.319 ¹⁴²	88.75 ²⁴⁷	19.843 ¹³¹	42.72 ¹
15.4	12.693 ⁸⁰	31.82 ⁷⁵	13.364 ⁸⁵	51.32 ⁷⁹	53.133 ¹⁸⁶	90.83 ²⁰⁸	19.679 ¹⁶⁴	44.68 ¹
25.3	12.599 ⁹⁴	32.61 ⁷⁹	13.260 ¹⁰⁴	51.81 ⁴⁹	52.905 ²²⁸	92.49 ¹⁶⁶	19.490 ¹⁸⁹	46.34 ¹
Dec. 5.3	12.494 ¹⁰⁵	33.41 ⁸⁰	13.139 ¹²¹	51.97 ¹⁶	52.644 ²⁶¹	93.66 ¹¹⁷	19.285 ²⁰⁵	47.63 ¹
	110	78	131	16	285	66	216	
15.3	12.384	34.19	13.008	51.81	52.359	94.32	19.069	48.50
25.2	12.271 ¹¹³	34.91 ⁷²	12.870 ¹³⁸	51.35 ⁴⁶	52.056 ³⁰³	94.44 ¹²	18.852 ²¹⁷	48.92 ¹
35.2	12.158 ¹¹³	35.56 ⁶⁵	12.730 ¹⁴⁰	50.58 ⁷⁷	51.748 ³⁰⁸	94.01 ⁴³	18.640 ²¹²	48.87
Mean Place	8.326	58.63	8.739	15.87	47.614	51.14	15.139	59.87
Sec δ , Tan δ	1.066	-0.108	1.140	+0.546	1.925	+1.645	1.445	-1.043
$D\psi\alpha$, $D_w\alpha$	+0.06	+0.01	+0.06	-0.04	+0.06	-0.11	+0.06	+0.07
$D\psi\delta$, $D_w\delta$	+0.4	0.0	+0.4	0.0	+0.4	0.0	+0.4	0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	22 Andromedæ. Mag. 5.1		γ Pegasi. Mag. 2.9		σ Andromedæ. Mag. 4.5		ι Ceti. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 6	" ' s +45 36	h m 0 9	" ' s +14 43	h m 0 14	" ' s +36 19	h m 0 15	" ' s - 9 16
Jan. 0.2	4.090	77.99	1.605	50.69	3.331	68.20	15.962	39.85
10.2	3.889	77.13	1.490	49.86	3.172	67.36	15.850	40.40
20.2	3.698	75.85	1.381	48.91	3.018	66.19	15.744	40.81
30.2	3.524	74.22	1.282	47.90	2.875	64.74	15.647	41.04
Feb. 9.1	3.374	72.29	1.197	46.85	2.752	63.05	15.563	41.09
19.1	3.257	70.13	1.134	45.82	2.653	61.21	15.500	40.94
Mar. 1.1	3.182	67.86	1.098	44.87	2.589	59.30	15.460	40.58
11.0	3.155	65.56	1.092	44.05	2.565	57.41	15.450	40.00
21.0	3.183	63.33	1.123	43.42	2.587	55.61	15.473	39.17
31.0	3.268	61.29	1.194	43.02	2.657	54.00	15.533	38.11
Apr 10.0	3.413	59.49	1.306	42.89	2.779	52.64	15.632	36.82
19.9	3.615	58.04	1.460	43.06	2.952	51.61	15.771	35.31
29.9	3.871	56.99	1.655	43.55	3.174	50.95	15.951	33.60
May 9.9	4.175	56.38	1.887	44.34	3.440	50.70	16.167	31.72
19.8	4.521	56.24	2.152	45.45	3.744	50.87	16.416	29.71
29.8	4.898	56.58	2.442	46.83	4.077	51.46	16.693	27.61
June 8.8	5.298	57.39	2.753	48.47	4.433	52.47	16.990	25.48
18.8	5.708	58.64	3.074	50.31	4.801	53.85	17.301	23.38
28.7	6.118	60.31	3.397	52.30	5.171	55.59	17.617	21.34
July 8.7	6.516	62.35	3.714	54.41	5.534	57.63	17.929	19.43
18.7	6.896	64.70	4.016	56.57	5.879	59.91	18.229	17.71
28.7	7.246	67.32	4.299	58.72	6.202	62.38	18.512	16.20
Aug. 7.6	7.559	70.13	4.553	60.80	6.493	65.00	18.768	14.95
17.6	7.830	73.07	4.775	62.80	6.747	67.68	18.994	13.96
27.6	8.055	76.08	4.962	64.67	6.961	70.38	19.186	13.28
Sept. 6.5	8.230	79.11	5.111	66.35	7.132	73.05	19.339	12.89
16.5	8.357	82.09	5.221	67.85	7.259	75.62	19.453	12.79
26.5	8.436	84.96	5.293	69.13	7.344	78.06	19.529	12.96
Oct. 6.5	8.467	87.67	5.330	70.18	7.388	80.33	19.568	13.36
16.4	8.454	90.16	5.335	71.01	7.393	82.37	19.574	13.95
26.4	8.401	92.38	5.310	71.61	7.363	84.16	19.549	14.71
Nov. 5.4	8.312	94.31	5.260	71.98	7.301	85.67	19.499	15.57
15.4	8.191	95.87	5.189	72.13	7.213	86.86	19.427	16.49
25.3	8.043	97.05	5.101	72.09	7.100	87.70	19.339	17.43
Dec. 5.3	7.872	97.80	5.000	71.83	6.968	88.20	19.238	18.34
15.3	7.685	98.10	4.890	71.38	6.822	88.31	19.128	19.20
25.2	7.488	97.95	4.773	70.77	6.665	88.04	19.013	19.97
35.2	7.285	97.34	4.654	69.99	6.503	87.40	18.897	20.62
Mean Place	3.229	57.48	0.680	39.87	2.379	50.29	15.015	42.20
Sec δ, Tan δ	1.430	+1.022	1.034	+0.263	1.241	+0.736	1.013	-0.163
Dψ α, Dω α	+0.06	-0.07	+0.06	-0.02	+0.06	-0.05	+0.06	+0.01
Dψ δ, Dω δ	+0.4	0.0	+0.4	0.0	+0.4	+0.1	+0.4	+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Tucanæ. Mag. 4.3		44 Piscium. Mag. 6.0		β Hydri. Mag. 2.9		α Phœnicis. Mag. 2.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 15	° ' " -65 20	h m 0 21	° ' " +1 29	h m 0 21	° ' " -77 42	h m 0 22	° ' " -42 44
Jan. 0.2	49.31	94.87	12.903	14.23	28.21	71.05	14.998	72.55
10.2	48.90	94.07	12.793	13.54	27.29	70.04	14.807	72.46
20.2	48.51	92.71	12.687	12.88	26.43	68.42	14.624	71.91
30.2	48.17	90.82	12.589	12.28	25.65	66.26	14.459	70.94
Feb. 9.1	47.88	88.48	12.503	11.77	24.97	63.62	14.314	69.56
19.1	47.64	85.73	12.437	11.39	24.41	60.58	14.198	67.79
Mar. 1.1	47.46	82.64	12.393	11.16	23.98	57.23	14.114	65.68
11.0	47.36	79.29	12.378	11.11	23.70	53.62	14.068	63.30
21.0	47.33	75.74	12.396	11.28	23.56	49.86	14.066	60.65
31.0	47.39	72.10	12.452	11.67	23.58	46.02	14.110	57.82
Apr. 10.0	47.52	68.42	12.547	12.33	23.76	42.19	14.205	54.86
19.9	47.73	64.77	12.683	13.23	24.08	38.45	14.349	51.80
29.9	48.03	61.26	12.859	14.39	24.56	34.89	14.542	48.75
May 9.9	48.40	57.93	13.073	15.77	25.19	31.56	14.783	45.74
19.9	48.83	54.88	13.320	17.38	25.93	28.56	15.065	42.84
29.8	49.34	52.17	13.594	19.16	26.79	25.95	15.385	40.13
June 8.8	49.88	49.85	13.889	21.07	27.74	23.77	15.735	37.68
18.8	50.45	47.99	14.198	23.06	28.75	22.09	16.105	35.53
28.7	51.05	46.62	14.512	25.09	29.81	20.94	16.486	33.75
July 8.7	51.65	45.79	14.823	27.10	30.88	20.37	16.867	32.38
18.7	52.23	45.51	15.123	29.04	31.94	20.37	17.240	31.44
28.7	52.77	45.78	15.406	30.86	32.94	20.94	17.591	30.97
Aug. 7.6	53.28	46.60	15.663	32.50	33.87	22.07	17.916	31.00
17.6	53.73	47.93	15.891	33.95	34.69	23.71	18.202	31.47
27.6	54.10	49.73	16.085	35.17	35.37	25.83	18.444	32.41
Sept. 6.6	54.39	51.93	16.242	36.16	35.90	28.34	18.637	33.75
16.5	54.59	54.46	16.362	36.89	36.26	31.14	18.778	35.45
26.5	54.69	57.20	16.444	37.36	36.43	34.15	18.866	37.42
Oct. 6.5	54.68	60.07	16.492	37.60	36.41	37.24	18.902	39.60
16.4	54.60	62.94	16.507	37.64	36.20	40.29	18.888	41.89
26.4	54.43	65.70	16.492	37.47	35.82	43.20	18.828	44.19
Nov. 5.4	54.18	68.22	16.453	37.14	35.28	45.83	18.729	46.40
15.4	53.87	70.42	16.392	36.68	34.59	48.07	18.595	48.43
25.3	53.50	72.20	16.312	36.12	33.79	49.84	18.434	50.21
Dec. 5.3	53.10	73.49	16.220	35.47	32.91	51.07	18.254	51.68
15.3	52.67	74.23	16.117	34.76	31.98	51.70	18.062	52.76
25.3	52.24	74.40	16.007	34.04	31.03	51.69	17.863	53.41
35.2	51.82	73.97	15.895	33.32	30.08	51.07	17.664	53.62
Mean Place	48.629	82.78	11.910	8.13	27.820	57.82	14.089	64.66
Sec δ , Tan δ	2.398	-2.179	1.000	+0.026	4.700	-4.592	1.362	-0.924
$D\psi\alpha$, $D\omega\alpha$	+0.06	+0.15	+0.06	0.00	+0.05	+0.31	+0.06	+0.06
$D\psi\delta$, $D\omega\delta$	+0.4	+0.1	+0.4	+0.1	+0.4	+0.1	+0.4	+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	12 Ceti. Mag. 6.0		13 Ceti. Mag. 5.2		ζ Cassiopeiæ. Mag. 3.7		π Andromedæ. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 25	° / - 4 24	h m 0 31	° / - 4 2	h m 0 32	° / +53 26	h m 0 32	° / +33 16
	s	"	s	"	s	"	s	"
Jan. 0.2	52.272	32.73	2.647	34.39	24.878	67.40	30.928	22.25
10.2	52.161 ¹¹¹	33.37 ⁶⁴	2.536 ¹¹¹	35.04 ⁶⁵	24.624 ²⁵⁴	66.91 ⁴⁹	30.778 ¹⁵⁰	21.54 ⁷¹
20.2	52.052 ¹⁰⁹	33.90 ⁵³	2.426 ¹¹⁰	35.59 ⁵⁵	24.372 ²⁵²	65.93 ⁹⁸	30.627 ¹⁵¹	20.54 ¹⁰⁰
30.2	51.951 ¹⁰¹	34.32 ⁴²	2.324 ¹⁰²	36.02 ⁴³	24.132 ²⁴⁰	64.51 ¹⁴²	30.483 ¹⁴⁴	19.26 ¹²⁸
Feb. 9.1	51.862 ⁸⁹	34.58 ²⁶	2.232 ⁹²	36.30 ²⁸	23.916 ²¹⁶	62.70 ¹⁸¹	30.354 ¹²⁹	17.77 ¹⁴⁹
	71	11	74	12	182	213	107	165
19.1	51.791	34.69	2.158	36.42	23.734	60.57	30.247	16.12
Mar. 1.1	51.742	34.61	2.106	36.36	23.598	58.23	30.170	14.40
	20	8	24	6	81	247	41	171
11.1	51.722	34.31	2.082	36.08	23.517	55.76	30.129	12.69
	13	51	9	49	18	248	1	162
21.0	51.735	33.80	2.091	35.59	23.499	53.28	30.130	11.07
	49	76	45	73	51	239	49	147
31.0	51.784	33.04	2.136	34.86	23.550	50.89	30.179	9.60
	90	100	85	97	120	220	98	123
Apr. 10.0	51.874	32.04	2.221	33.89	23.670	48.69	30.277	8.37
	130	124	126	122	192	193	149	95
19.9	52.004	30.80	2.347	32.67	23.862	46.76	30.426	7.42
	171	146	166	143	257	157	199	59
29.9	52.175	29.34	2.513	31.24	24.119	45.19	30.625	6.83
	208	167	205	164	318	115	243	22
May 9.9	52.383	27.67	2.718	29.60	24.437	44.04	30.868	6.61
	242	183	238	181	371	69	282	18
19.9	52.625	25.84	2.956	27.79	24.808	43.35	31.150	6.79
	271	195	260	194	414	21	316	57
29.8	52.896	23.89	3.225	25.85	25.222	43.14	31.466	7.36
	293	204	291	203	444	29	339	94
June 8.8	53.189	21.85	3.516	23.82	25.666	43.43	31.805	8.30
	308	207	307	206	462	77	357	132
18.8	53.497	19.78	3.823	21.76	26.128	44.20	32.162	9.62
	313	205	313	204	468	123	361	163
28.8	53.810	17.73	4.136	19.72	26.596	45.43	32.523	11.25
	312	197	313	198	464	166	357	191
July 8.7	54.122	15.76	4.449	17.74	27.060	47.09	32.880	13.16
	301	184	303	185	445	204	345	215
18.7	54.423	13.92	4.752	15.89	27.505	49.13	33.225	15.31
	285	166	288	167	420	238	326	232
28.7	54.708	12.26	5.040	14.22	27.925	51.51	33.551	17.63
	261	145	264	147	384	266	298	244
Aug. 7.6	54.969	10.81	5.304	12.75	28.309	54.17	33.849	20.07
	232	120	236	122	341	288	265	250
17.6	55.201	9.61	5.540	11.53	28.650	57.05	34.114	22.57
	198	94	203	97	292	304	228	252
27.6	55.399	8.67	5.743	10.56	28.942	60.09	34.342	25.09
	161	66	166	68	240	313	190	248
Sept. 6.6	55.560	8.01	5.909	9.88	29.182	63.22	34.532	27.57
	124	40	130	42	186	316	148	239
16.5	55.684	7.61	6.039	9.46	29.368	66.38	34.680	29.96
	87	13	94	14	131	313	107	227
26.5	55.771	7.48	6.133	9.32	29.499	69.51	34.787	32.23
	52	11	56	10	77	303	67	209
Oct. 6.5	55.823	7.59	6.189	9.42	29.576	72.54	34.854	34.32
	17	34	24	32	25	288	30	190
16.5	55.840	7.93	6.213	9.74	29.601	75.42	34.884	36.22
	12	50	5	49	25	266	4	166
26.4	55.828	8.43	6.208	10.23	29.576	78.08	34.880	37.88
	38	64	34	63	72	240	37	141
Nov. 5.4	55.790	9.07	6.174	10.86	29.504	80.48	34.843	39.29
	70	74	55	74	116	207	65	111
15.4	55.730	9.81	6.119	11.60	29.388	82.55	34.778	40.40
	89	75	79	79	155	168	90	81
25.3	55.651	10.61	6.044	12.39	29.233	84.23	34.688	41.21
	92	81	89	82	187	126	111	50
Dec. 5.3	55.559	11.42	5.955	13.21	29.046	85.49	34.577	41.71
	104	81	101	81	218	79	128	15
15.3	55.455	12.23	5.854	14.02	28.828	86.28	34.449	41.86
	110	77	109	78	238	30	143	20
25.3	55.345	13.00	5.745	14.80	28.590	86.58	34.306	41.66
	116	71	114	71	254	20	151	52
35.2	55.229	13.71	5.631	15.51	28.336	86.38	34.155	41.14
Mean Place	51.258	36.73	1.603	38.49	23.720	44.91	29.818	5.30
Sec δ, Tan δ	1.003	-0.077	1.002	-0.071	1.679	+1.349	1.196	+0.656
D _α a, D _ω a	+0.06	+0.01	+0.06	0.00	+0.07	-0.09	+0.06	-0.04
D _α δ, D _ω δ	+0.4	+0.1	+0.4	+0.1	+0.4	+0.1	+0.4	+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Andromedæ. Mag. 4.5		δ Andromedæ. Mag. 3.5		α Cassiopeiæ. (Schedir.) Var. 2.2-2.8		μ Phœnicis. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 34	° ' " +28 52	h m 0 34	° ' " +30 24	h m 0 35	° ' " +56 5	h m 0 37	° ' " -46 31
Jan. 0.2	14.234	15.65	57.476	60.32	51.874	39.25	28.114	76.32
10.2	14.094 ¹⁴⁰	14.92 ⁷³	57.333 ¹⁴³	59.61 ⁷¹	51.597 ²⁷⁷	38.84 ⁴¹	27.894 ²²⁰	76.28 ⁴
20.2	13.954 ¹⁴⁰	13.94 ⁹⁸	57.190 ¹⁴³	58.63 ⁹⁸	51.321 ²⁷⁶	37.92 ⁹²	27.683 ²¹¹	75.76 ⁵²
30.2	13.821 ¹³³	12.73 ¹²¹	57.052 ¹³⁸	57.40 ¹²³	51.057 ²⁶⁴	36.53 ¹³⁰	27.485 ¹⁹⁸	74.78 ⁹⁸
Feb. 9.1	13.701 ¹⁰²	11.35 ¹⁴⁹	56.929 ¹²³	55.99 ¹⁴¹	50.816 ²⁴¹	34.73 ¹⁸⁰	27.309 ¹⁷⁶	73.36 ¹⁴²
19.1	13.599 ⁷²	9.86 ¹⁵⁴	56.825 ¹⁰⁴	54.46 ¹⁵³	50.613 ¹⁵⁴	32.60 ²¹³	27.160 ¹¹⁵	71.52 ¹⁸⁴
Mar. 1.1	13.527 ³⁹	8.32 ¹⁵¹	56.750 ⁴⁰	52.86 ¹⁸⁰	50.459 ⁹⁵	30.22 ²³⁸	27.045 ⁷⁶	69.31 ²²¹
11.1	13.488 [—]	6.81 ¹⁴²	56.710 ⁰	51.28 ¹⁵⁸	50.364 ²⁹	27.69 ²⁵³	26.969 ³²	66.79 ²⁵²
21.0	13.489 ⁴⁴	5.39 ¹²³	56.710 ⁴⁶	49.79 ¹⁴⁰	50.335 ⁴⁶	25.13 ²⁴⁹	26.937 ¹⁸	64.01 ²⁹⁸
31.0	13.533 ⁹⁴	4.16 ¹⁰⁰	56.756 ⁹⁵	48.47 ¹⁰⁸	50.381 ¹¹⁹	22.64 ²³³	26.955 ⁶⁹	61.03 ³¹²
Apr. 10.0	13.627 ¹⁴²	3.16 ⁷¹	56.851 ¹⁴³	47.39 ⁷⁸	50.500 ¹⁹⁶	20.31 ²⁰⁴	27.024 ¹²⁴	57.91 ³²¹
19.9	13.769 ¹⁸⁷	2.45 ³⁷	56.994 ¹⁹¹	46.61 ⁴⁷	50.696 ²⁶⁶	18.27 ¹⁷⁰	27.148 ¹⁷⁷	54.70 ³²²
29.9	13.956 ²³²	2.08 ³	57.185 ²³⁵	46.14 ⁹	50.962 ³³²	16.57 ¹²⁸	27.325 ²²⁹	51.48 ³¹⁷
May 9.9	14.188 ²⁷¹	2.05 ³⁶	57.420 ²⁷⁴	46.05 ²⁹	51.294 ³⁸⁷	15.29 ⁸³	27.554 ²⁷⁷	48.31 ³⁰³
19.9	14.459 ³⁰⁴	2.41 ⁷²	57.694 ³⁰⁷	46.34 ⁶⁵	51.681 ⁴³³	14.46 ³⁵	27.831 ⁸¹⁸	45.28 ²⁸⁵
29.8	14.763 ³²⁵	3.13 ¹⁰⁸	58.001 ³³¹	46.99 ¹⁰³	52.114 ⁴⁶⁵	14.11 ¹⁶	28.149 ³⁵³	42.43 ²⁵⁸
June 8.8	15.088 ³⁴²	4.21 ¹⁴⁰	58.332 ³⁴⁷	48.02 ¹³⁵	52.579 ⁴⁸⁶	14.27 ⁶⁵	28.502 ³⁷⁷	39.85 ²²⁶
18.8	15.430 ³⁴⁹	5.61 ¹⁶⁹	58.679 ³⁵⁴	49.37 ¹⁶⁷	53.065 ⁴⁹⁵	14.92 ¹¹³	28.879 ³⁹²	37.59 ¹⁸⁹
28.8	15.779 ³⁴⁵	7.30 ²¹³	59.033 ³³⁹	51.04 ¹⁹¹	53.560 ⁴⁸⁸	16.05 ¹⁹⁸	29.271 ³⁰⁸	35.70 ¹⁴⁴
July 8.7	16.124 ³¹⁵	9.23 ²²⁵	59.382 ³²¹	52.95 ²²⁷	54.048 ⁴⁴⁵	17.63 ²³³	29.669 ⁸⁷⁵	34.26 ⁴⁹
18.7	16.459 ²⁹⁰	11.36 ²³⁵	59.721 ²⁹³	55.08 ²³⁸	54.521 ⁴⁰⁷	19.61 ²⁶⁴	30.061 ⁸⁴⁸	33.28 ²
28.7	16.774 ²⁵⁸	13.61 ²³⁷	60.042 ²⁶²	57.35 ²⁴¹	54.966 ³⁶³	21.94 ²⁸⁷	30.436 ⁸¹³	32.79 ⁵¹
Aug. 7.6	17.064 ²²²	15.96 ²²⁸	60.335 ¹⁸⁹	59.73 ²³⁶	55.373 ²⁵⁸	24.58 ³¹⁷	30.784 ²¹⁹	32.81 ¹⁴²
17.6	17.322 ¹⁸⁵	18.33 ²¹⁸	60.597 ¹⁴⁷	62.14 ²²⁵	55.736 ¹⁴³	27.45 ³²¹	31.097 ¹¹⁰	33.32 ²¹¹
27.6	17.544 ⁶⁸	20.69 ¹⁸⁶	60.823 ⁶⁹	64.55 ¹⁹⁴	56.050 ⁸⁶	30.52 ³¹³	31.366 ⁵⁴	34.31 ²³³
Sept. 6.6	17.729 ¹⁰⁵	22.97 ¹⁸⁶	61.012 ¹⁰⁹	66.91 ¹⁹⁴	56.308 ²⁰²	33.69 ²⁹⁸	31.585 ²¹⁹	35.73 ²⁴⁸
16.5	17.873 ³³	25.15 ¹¹⁶	61.159 ³²	69.16 ¹²⁵	56.510 ⁷⁴	36.91 ²⁵²	31.585 ⁹⁶	37.53 ²⁴¹
26.5	17.978 ⁵⁹	27.17 ⁹⁰	61.268 ⁵⁸	71.26 ⁹⁸	56.653 ¹²²	40.12 ²²⁰	31.750 ¹³⁶	39.64 ²²³
Oct. 6.5	18.046 ³¹	29.03 ¹⁸³	61.337 ³³	73.20 ¹⁷³	56.739 ²⁰³	43.25 ²⁷⁹	31.860 ⁵¹	39.64 ²⁴⁸
16.5	18.077 ¹	30.66 ¹⁴²	61.370 ¹	74.93 ¹⁵²	56.769 ²⁴	46.23 ²⁹⁸	31.913 ¹	41.97 ²⁴⁶
26.4	18.076 ³³	32.08 ¹¹⁶	61.371 ³²	76.45 ¹²⁵	56.745 ⁷⁴	49.02 ²⁵²	31.862 ⁹⁶	44.43 ²⁴⁸
Nov. 5.4	18.043 ⁵⁹	33.24 ⁹⁰	61.339 ⁵⁸	77.70 ⁹⁸	56.671 ¹²²	51.54 ²²⁰	31.862 ¹³⁶	46.91 ²⁴¹
15.4	17.984 ⁸²	34.14 ⁸³	61.281 ⁸³	78.68 ⁹⁹	56.549 ¹⁶⁶	53.74 ¹⁸¹	31.766 ¹⁶⁰	49.32 ²²³
25.3	17.902 ¹⁰²	34.74 ⁶⁰	61.198 ¹⁰³	79.37 ⁴⁰	56.383 ²³⁴	55.55 ⁹¹	31.630 ²²¹	51.55 ¹⁹⁷
Dec. 5.3	17.800 ¹¹⁹	35.06 ²	61.095 ¹²²	79.77 ⁷	56.180 ²³⁴	56.94 ⁹¹	31.461 ²¹¹	53.52 ¹⁶²
15.3	17.681 ¹³¹	35.08 ⁵⁹	60.973 ¹³⁴	79.84 ²⁵	55.946 ²⁶⁰	57.85 ⁴⁰	31.269 ²²¹	55.14 ¹²²
25.3	17.550 ¹⁴⁰	34.79 ²⁹	60.839 ¹⁴³	79.59 ⁵⁴	55.686 ²⁷⁶	58.25 ¹⁰	31.058 ²²¹	56.36 ⁷⁶
35.2	17.410	34.22	60.696	79.05	55.410	58.15	30.837 ²²³	57.12 ²⁹
Mean Place	13.118	0.11	56.351	44.28	50.661	16.18	27.122	67.43
Sec δ , Tan δ	1.142	+0.551	1.160	+0.587	1.792	+1.488	1.454	-1.055
$D\psi\alpha$, $D_\alpha\alpha$	+0.06	-0.04	+0.06	-0.04	+0.07	-0.10	+0.06	+0.07
$D\psi\delta$, $D_\alpha\delta$	+0.4	+0.1	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Ceti. Mag. 2.2		α Cassiopeiæ. Mag. 4.7		21 Cassiopeiæ. Mag. 5.6		ζ Andromedæ. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 39	s -18 25	h m 0 40	s +47 50	h m 0 40	s +74 32	h m 0 42	s +23 49
Jan. 0.3	29.524	71.96	10.176	30.08	13.96	50.52	60.493	30.57
10.2	29.398 ¹²⁶	72.46	9.962 ²¹⁴	29.59	13.26	50.52	60.364 ¹²⁹	29.88
20.2	29.273 ¹²⁵	72.71	9.749 ²¹³	28.67	12.57	49.90	60.232 ¹³²	28.98
30.2	29.156 ¹¹⁷	72.70	9.543 ²⁰⁶	27.33	11.91	48.70	60.104 ¹²⁸	27.91
Feb. 9.1	29.050 ¹⁰⁶	72.42	9.354 ¹⁸⁹	25.65	11.30	46.96	59.988 ¹¹⁶	26.70
19.1	28.960 ⁹⁰	71.88	9.194 ¹⁶⁰	23.69	10.78	44.75	59.888 ¹⁰⁰	25.42
Mar. 1.1	28.893 ⁶⁷	71.06	9.072 ¹²²	21.53	10.38	42.17	59.813 ⁷⁵	24.13
11.1	28.855 ³⁸	69.97	8.997 ⁷⁵	19.27	10.10	39.34	59.769 ²⁸³	22.88
21.0	28.849 ⁶	68.64	8.976 ²¹	17.01	9.96	36.36	59.763 ²⁹⁸	21.76
31.0	28.881 ³²	67.05	9.015 ¹⁵⁹	14.85	9.98	33.36	59.800 ³⁰⁰	20.80
Apr. 10.0	28.954 ⁷³	65.25	9.118 ¹⁰³	12.87	10.16	30.46	59.881 ²⁰⁰	20.09
20.0	29.069 ¹¹⁵	63.26	9.283 ¹⁶⁵	11.18	10.49	27.78	60.009 ²⁶⁸	19.64
29.9	29.226 ¹⁵⁷	61.10	9.508 ²²⁵	9.81	10.96	25.40	60.183 ²³⁸	19.51
May 9.9	29.424 ¹⁹⁸	58.82	9.791 ²⁸³	8.84	11.57	23.42	60.401 ¹⁹⁸	19.72
19.9	29.657 ²³³	56.47	10.120 ³²⁹	8.32	12.29	21.91	60.656 ¹⁵¹	20.26
29.8	29.924 ²⁶⁷	54.10	10.490 ³⁷⁰	8.25	13.09	20.90	60.943 ¹⁰¹	21.13
June 8.8	30.215 ²⁹¹	51.77	10.891 ⁴⁰¹	8.63	13.95	20.44	61.256 ⁴⁶	22.33
18.8	30.526 ³¹¹	49.53	11.310 ⁴¹⁹	9.47	14.86	20.51	61.584 ⁷	23.80
28.8	30.846 ³²⁰	47.45	11.737 ⁴²⁷	10.74	15.79	21.14	61.921 ⁶³	25.52
July 8.7	31.167 ³²¹	45.57	12.161 ⁴²⁴	12.41	16.70	22.30	62.257 ¹¹⁶	27.43
18.7	31.482 ³¹⁵	43.95	12.573 ⁴¹²	14.42	17.59	23.95	62.584 ¹⁶⁵	29.50
28.7	31.781 ²⁹⁹	42.63	12.961 ³⁸⁸	16.73	18.43	26.07	62.894 ²¹²	31.66
Aug. 7.7	32.059 ²⁷⁸	41.63	13.318 ³⁵⁷	19.29	19.20	28.60	63.181 ²⁵³	33.86
17.6	32.308 ²⁴⁹	40.99	13.638 ³²⁰	22.03	19.89	31.47	63.438 ²⁸⁷	36.06
27.6	32.524 ²¹⁶	40.71	13.915 ²⁷⁷	24.90	20.49	34.65	63.661 ³¹⁸	38.20
Sept. 6.6	32.703 ¹⁷⁹	40.77	14.146 ²³¹	27.84	20.97	38.05	63.850 ³⁴⁰	40.24
16.5	32.844 ¹⁴¹	41.17	14.329 ¹⁸³	30.79	21.35	41.62	64.001 ³⁵⁷	42.16
26.5	32.945 ¹⁰¹	41.88	14.464 ¹³⁵	33.69	21.62	45.25	64.113 ²⁷	43.91
Oct. 6.5	33.007 ⁶²	42.82	14.550 ⁸⁶	36.48	21.76	48.90	64.189 ³⁶³	45.46
16.5	33.033 ²⁶	43.98	14.590 ⁴⁰	39.11	21.77	52.49	64.232 ³⁵⁹	46.82
26.4	33.026 ⁷	45.28	14.586 ⁴	41.54	21.68	55.92	64.241 ³⁴³	47.95
Nov. 5.4	32.989 ³⁷	46.65	14.541 ⁴⁵	43.70	21.47	59.14	64.221 ³²²	48.86
15.4	32.926 ⁶³	48.03	14.456 ⁸⁵	45.56	21.15	62.04	64.176 ²⁹⁰	49.52
25.4	32.843 ⁸³	49.36	14.336 ¹²⁰	47.06	20.72	64.56	64.106 ²⁵²	49.94
Dec. 5.3	32.742 ¹⁰¹	50.58	14.187 ¹⁴⁹	48.17	20.21	66.62	64.017 ²⁰⁶	50.10
15.3	32.628 ¹¹⁴	51.66	14.010 ¹⁷⁷	48.85	19.62	68.16	63.911 ¹⁵⁴	50.01
25.3	32.505 ¹²³	52.55	13.814 ¹⁹⁶	49.08	18.97	69.12	63.791 ⁹⁶	49.66
35.2	32.377 ¹²⁸	53.22	13.602 ²¹²	48.85	18.28	69.49	63.661 ³⁷	49.09
Mean Place	28.456	71.06	8.949	9.02	12.420	24.36	59.322	16.75
Sec δ , Tan δ	1.054	-0.333	1.490	+1.104	3.752	+3.617	1.093	+0.442
$D\delta\alpha$, $D\alpha\alpha$	+0.06	+0.02	+0.07	-0.07	+0.08	-0.24	+0.06	-0.03
$D\delta\delta$, $D\alpha\delta$	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	77 Cassiopeæ. Mag. 3.6		δ Piscium. Mag. 4.6		λ Hydri. Mag. 5.0		20 Ceti. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 44	° ' " +57 22	h m 0 44	° ' " + 7 8	h m 0 45	° ' " -75 21	h m 0 48	° ' " - 1 34
Jan. 0.3	8.144	78.02	26.725	28.60	46.24	83.19	50.092	76.08
10.2	8.859 ²⁸⁵	77.71 ³¹	26.612 ¹¹³	27.88 ⁷²	45.44 ⁸⁰	82.58 ⁶¹	49.979 ¹¹³	76.71 ⁶⁶
20.2	8.571 ²⁸⁸	76.88 ⁸³	26.498 ¹¹⁴	27.15 ⁷³	44.67 ⁷⁷	81.37 ¹²¹	49.864 ¹¹⁵	77.32 ⁶¹
30.2	8.293 ²⁷⁸	75.58 ¹³⁰	26.388 ¹¹⁰	26.41 ⁷⁴	43.95 ⁷²	79.59 ¹⁷⁸	49.753 ¹¹¹	77.83 ⁵¹
Feb. 9.1	8.039 ²⁵⁴	73.86 ¹⁷⁰	26.286 ¹⁰²	25.73 ⁶⁸	43.30 ⁶⁵	77.30 ²²⁹	49.650 ¹⁰³	77.82 ³⁹
19.1	7.822 ²¹⁷	71.76 ²¹²	26.199 ⁸⁷	25.11 ⁶²	42.73 ⁵⁷	74.56 ²⁷⁴	49.561 ⁸⁹	78.46 ²⁴
Mar. 1.1	7.652 ¹⁷⁰	69.41 ²³⁵	26.135 ⁶⁴	24.59 ⁵²	42.27 ⁴⁶	71.44 ³¹²	49.494 ⁶⁷	78.53 ⁷
11.1	7.542 ¹¹⁰	66.88 ²⁵³	26.098 ³⁷	24.22 ³⁷	41.92 ³⁵	68.02 ³⁴²	49.452 ⁴²	78.41 ¹²
21.0	7.501 ⁴¹	64.29 ²⁵⁹	26.092 ⁶	24.05 ¹⁷	41.69 ²³	64.40 ³⁶²	49.443 ⁹	78.07 ³⁴
31.0	7.535 ³⁴	61.75 ²⁵⁴	26.126 ³⁴	24.08 ³	41.60 ⁹	60.65 ³⁷⁵	49.470 ²⁷	77.51 ⁵⁶
Apr. 10.0	7.646 ¹¹¹	59.35 ²⁴⁰	26.200 ⁷⁴	24.36 ²⁸	41.64 ⁴	56.84 ³⁸¹	49.537 ⁶⁷	76.70 ⁸¹
20.0	7.836 ¹⁹⁰	57.21 ²¹⁴	26.316 ¹¹⁶	24.89 ⁵³	41.80 ¹⁶	53.06 ³⁷⁸	49.645 ¹⁰⁸	75.66 ¹⁰⁴
29.9	8.100 ²⁶⁴	55.39 ¹⁸²	26.475 ¹⁵⁹	25.70 ⁸¹	42.10 ³⁰	49.39 ³⁶⁷	49.795 ¹⁵⁰	74.37 ¹²⁹
May 9.9	8.434 ³³⁴	53.97 ¹⁴²	26.673 ¹⁹⁸	26.77 ¹⁰⁷	42.54 ⁴⁴	45.93 ³⁴⁶	49.985 ¹⁹⁰	72.87 ¹⁵³
19.9	8.827 ³⁹³	53.00 ⁹⁷	26.907 ²³⁴	28.08 ¹³¹	43.09 ⁵⁵	42.72 ³²¹	50.212 ²²⁷	71.17 ¹⁷⁰
29.8	9.268 ⁴⁴¹	52.51 ⁴⁹	27.173 ²⁶⁶	29.61 ¹⁵⁸	43.74 ⁶⁶	39.85 ²⁸⁷	50.470 ²⁵⁸	69.32 ¹⁸⁵
June 8.8	9.746 ⁴⁷⁸	52.52 ¹	27.462 ²⁸⁹	31.33 ¹⁷²	44.48 ⁷⁴	37.39 ²⁴⁶	50.752 ²⁸²	67.37 ¹⁹⁶
18.8	10.249 ⁵⁰³	53.02 ⁵⁰	27.770 ³⁰⁸	33.18 ¹⁸⁶	45.31 ⁸³	35.40 ¹⁹⁹	51.053 ³⁰¹	65.36 ²⁰¹
28.8	10.761 ⁵¹²	54.00 ⁹⁸	28.085 ³¹⁵	35.13 ¹⁹⁵	46.17 ⁸⁶	33.90 ¹⁵⁰	51.364 ³¹¹	63.33 ²⁰³
July 8.7	11.271 ⁵¹⁰	55.44 ¹⁴⁴	28.401 ³¹⁶	37.12 ¹⁹⁹	47.07 ⁹⁰	32.98 ⁹²	51.676 ³¹²	61.35 ¹⁹⁸
18.7	11.765 ⁴⁹⁴	57.30 ¹⁸⁶	28.709 ³⁰⁸	39.10 ¹⁹⁸	47.96 ⁸⁹	32.61 ³⁷	51.982 ³⁰⁶	59.46 ¹⁸⁹
28.7	12.234 ⁴⁶⁹	59.54 ²²⁴	29.002 ²⁹³	41.02 ¹⁹²	48.82 ⁸⁶	32.83 ²²	52.275 ²⁹³	57.71 ¹⁷⁵
Aug. 7.7	12.667 ⁴³³	62.08 ²⁵⁴	29.275 ²⁷³	42.82 ¹⁸⁰	49.64 ⁸²	33.63 ⁸⁰	52.548 ²⁷³	56.16 ¹⁵⁵
17.6	13.056 ³⁸⁰	64.87 ²⁷⁹	29.519 ²⁴⁴	44.47 ¹⁶⁵	50.38 ⁷⁴	34.98 ¹³⁵	52.793 ²⁴⁵	54.83 ¹³³
27.6	13.394 ³³⁸	67.88 ³⁰¹	29.732 ²¹³	45.94 ¹⁴⁷	51.01 ⁶³	36.84 ¹⁸⁶	53.008 ²¹⁵	53.75 ¹⁰⁸
Sept. 6.6	13.678 ²⁸⁴	71.01 ³¹³	29.910 ¹⁷⁸	47.19 ¹²⁵	51.52 ⁵¹	39.15 ²³¹	53.190 ¹⁸²	52.94 ⁸¹
16.5	13.904 ²²⁶	74.22 ³²¹	30.054 ¹⁴⁴	48.23 ¹⁰⁴	51.90 ³⁸	41.82 ²⁶⁷	53.336 ¹⁴⁶	52.38 ⁵⁶
26.5	14.071 ¹⁶⁷	77.43 ³²¹	30.162 ¹⁰⁸	49.03 ⁸⁰	52.12 ²²	44.75 ²⁹³	53.446 ¹¹⁰	52.10 ²⁸
Oct. 6.5	14.179 ¹⁰⁸	80.58 ³¹⁵	30.234 ⁷²	49.60 ⁵⁷	52.19 ⁷	47.84 ³⁰⁹	53.520 ⁷⁴	52.06 ⁴
16.5	14.227 ⁴⁸	83.62 ³⁰⁴	30.274 ⁴⁰	49.95 ³⁵	52.10 ⁹	50.97 ³¹³	53.562 ⁴²	52.26 ²⁰
26.4	14.220 ⁷	86.47 ²⁸⁵	30.283 ⁹	50.09 ¹⁴	51.85 ²⁵	54.01 ³⁰⁴	53.573 ¹¹	52.63 ³⁷
Nov. 5.4	14.160 ⁶⁰	89.05 ²⁵⁸	30.266 ¹⁷	50.05 ⁴	51.47 ³⁸	56.85 ²⁸⁴	53.556 ¹⁷	53.16 ⁵³
15.4	14.049 ¹¹¹	91.34 ²²⁹	30.225 ⁴¹	49.83 ²²	50.95 ⁶²	59.36 ²⁵¹	53.516 ⁴⁰	53.81 ⁶⁵
25.4	13.893 ¹⁵⁶	93.25 ¹⁹¹	30.162 ⁶³	49.48 ³⁵	50.33 ⁶²	61.46 ²¹⁰	53.455 ⁶¹	54.56 ⁷⁵
Dec. 5.3	13.694 ¹⁹⁹	94.74 ¹⁴⁹	30.083 ⁷⁹	49.01 ⁴⁷	49.62 ⁷¹	63.06 ¹⁶⁰	53.375 ⁸⁰	55.34 ⁷⁸
15.3	13.460 ²³⁴	95.77 ¹⁰³	29.989 ⁹⁴	48.44 ⁵⁷	48.85 ⁷⁷	64.08 ¹⁰²	53.281 ⁹⁴	56.13 ⁷⁹
25.3	13.197 ²⁰³	96.29 ⁵²	29.884 ¹⁰⁵	47.79 ⁶⁵	48.05 ⁸⁰	64.50 ⁴²	53.176 ¹⁰⁵	56.91 ⁷⁸
35.2	12.915 ²⁸²	96.27 ²	29.771 ¹¹³	47.08 ⁷¹	47.24 ⁸¹	64.30 ²⁰	53.063 ¹¹³	57.64 ⁷³
Mean Place	7.807	54.75	25.582	20.61	45.358	69.93	48.940	80.88
Sec δ, Tan δ	1.855	+1.563	1.008	+0.125	3.959	-3.830	1.000	-0.028
D _μ α, D _μ α	+0.07	-0.10	+0.06	-0.01	+0.04	+0.26	+0.06	0.00
D _μ δ, D _μ δ	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cassiopeiæ. Mag. 2.2		μ Andromedæ. Mag. 3.9		α Sculptoris. Mag. 4.4		ϵ Piscium. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 51	° ' " +60 16	h m 0 52	° ' " +38 3	h m 0 54	° ' " -29 47	h m 0 58	° ' " +7 26
	s	"	s	"	s	"	s	"
Jan. 0.3	46.31	46.55	13.081	35.60	40.394	66.79	42.375	64.14
10.2	45.99 32	46.41 14	12.915 166	35.10 50	40.241 133	67.24 45	42.261 114	63.44 70
20.2	45.67 32	45.72 69	12.745 170	34.24 86	40.088 153	67.31 7	42.142 119	62.72 73
30.2	45.35 32	44.53 119	12.579 166	33.06 118	39.940 148	67.02 29	42.026 116	62.02 70
Feb. 9.2	45.05 30	42.88 165	12.424 153	31.62 144	39.804 136	66.37 65	41.916 110	61.34 68
	26	205	135	165	119	99	97	63
19.1	44.79 21	40.83 233	12.289 106	29.97 179	39.685 96	65.38 134	41.819 77	60.72 52
Mar. 1.1	44.58 14	38.50 256	12.183 68	28.18 185	39.589 67	64.04 165	41.742 52	60.20 38
11.1	44.44 6	35.94 264	12.115 24	26.33 182	39.522 31	62.39 192	41.690 18	59.82 19
21.0	44.38 2	33.30 262	12.091 25	24.51 170	39.491 8	60.47 218	41.672 19	59.63 1
31.0	44.40 9	30.68 250	12.116 79	22.81 152	39.499 52	58.29 238	41.691 60	59.64 25
Apr. 10.0	44.49 18	28.18 228	12.195 133	21.29 125	39.551 96	55.91 256	41.751 102	59.89 49
20.0	44.67 27	25.90 196	12.328 188	20.04 95	39.647 143	53.35 268	41.853 146	60.38 77
29.9	44.94 34	23.94 158	12.516 237	19.09 57	39.790 186	50.67 274	41.999 186	61.15 101
May 9.9	45.28 41	22.36 114	12.753 281	18.52 18	39.976 229	47.93 274	42.185 225	62.16 126
19.9	45.69 47	21.22 67	13.034 320	18.34 22	40.205 266	45.19 268	42.410 257	63.42 148
29.9	46.16 50	20.55 16	13.354 349	18.56 63	40.471 294	42.51 256	42.667 283	64.90 167
June 8.8	46.66 53	20.39 34	13.703 367	19.19 101	40.765 318	39.95 238	42.950 303	66.57 181
18.8	47.19 55	20.73 83	14.070 378	20.20 136	41.083 332	37.57 213	43.253 316	68.38 191
28.8	47.74 54	21.56 131	14.448 378	21.56 170	41.415 337	35.44 184	43.566 313	70.29 195
July 8.7	48.28 53	22.87 174	14.826 369	23.26 196	41.752 335	33.60 148	43.882 311	72.24 195
18.7	48.81 51	24.61 213	15.195 351	25.22 220	42.087 323	32.12 110	44.193 297	74.19 189
28.7	49.32 47	26.74 248	15.546 328	27.42 236	42.410 301	31.02 68	44.490 279	76.08 179
Aug. 7.7	49.79 41	29.22 276	15.874 295	29.78 249	42.711 275	30.34 25	44.769 253	77.87 164
17.6	50.20 37	31.98 299	16.169 259	32.27 255	42.986 241	30.09 18	45.022 223	79.51 147
27.6	50.57 32	34.97 315	16.428 220	34.82 257	43.227 203	30.27 59	45.245 192	80.98 125
Sept. 6.6	50.89 25	38.12 325	16.648 179	37.39 253	43.430 162	30.86 97	45.437 157	82.23 104
16.6	51.14 19	41.37 328	16.827 139	39.92 245	43.592 119	31.83 132	45.594 121	83.27 80
26.5	51.33 13	44.65 326	16.966 96	42.37 232	43.711 76	33.15 158	45.715 88	84.07 58
Oct. 6.5	51.46 6	47.91 315	17.062 56	44.69 214	43.787 36	34.73 177	45.803 54	84.65 35
16.5	51.52 0	51.06 298	17.118 19	46.83 195	43.823 2	36.50 189	45.857 24	85.00 15
26.4	51.52 6	54.04 277	17.137 17	48.78 169	43.821 39	38.39 194	45.881 3	85.15 3
Nov. 5.4	51.46 12	56.81 245	17.120 48	50.47 143	43.782 68	40.33 189	45.878 30	85.12 21
15.4	51.34 17	59.28 210	17.072 79	51.90 112	43.714 94	42.22 176	45.848 51	84.91 34
25.4	51.17 21	61.36 168	16.993 106	53.02 79	43.620 117	43.98 157	45.797 72	84.57 45
Dec. 5.3	50.96 26	63.04 121	16.887 129	53.81 44	43.503 133	45.55 132	45.725 87	84.12 56
15.3	50.70 29	64.25 70	16.758 148	54.25 7	43.370 146	46.87 101	45.638 102	83.56 63
25.3	50.41 32	64.95 18	16.610 163	54.32 30	43.224 154	47.88 68	45.536 112	82.93 70
35.3	50.09	65.13	16.447	54.02	43.070	48.56	45.424	82.23
Mean Place	44.831	22.77	11.782	17.36	39.260	62.23	41.142	56.16
Sec δ , Tan δ	2.017	+1.752	1.270	+0.783	1.153	-0.573	1.008	+0.131
$D\psi\alpha$, $D\omega\alpha$	+0.07	-0.11	+0.07	-0.05	+0.06	+0.04	+0.06	-0.01
$D\psi\delta$, $D\omega\delta$	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2	+0.4	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Phœnix. Mag. 3.4				μ Cassiopeia. Mag. 5.3				γ Ceti. Mag. 3.6				β Andromeda. Mag. 2.4			
	Right Ascension.		Declina- tion.		Right Ascension.		Declina- tion.		Right Ascension.		Declina- tion.		Right Ascension.		Declina- tion.	
	h m		° ' "		h m		° ' "		h m		° ' "		h m		° ' "	
	1	2	-47	8	1	2	+54	31	1	4	-10	36	1	5	+35	11
Jan. 0.3	26.641		97.90		49.733		29.83		29.102		57.94		9.510		27.18	
10.2	26.409	232	98.13	23	49.487	246	29.68	15	28.983	119	58.63	60	9.356	154	26.74	44
20.2	26.190	229	97.87	26	49.232	255	29.01	67	28.860	123	59.14	51	9.195	161	25.97	77
30.2	25.958	222	97.12	75	48.979	263	27.87	114	28.739	121	59.44	30	9.033	162	24.91	106
Feb. 0.2	25.752	206	95.89	123	48.743	236	26.31	166	28.625	114	59.54	10	8.880	153	23.61	130
		193		167		209		191		103		13		137		130
10.1	25.509		94.22		48.534		24.40		28.522		59.41		8.743		22.11	
Mar. 1.1	25.417	152	92.16	206	48.365	169	22.20	220	28.437	85	59.06	35	8.632	111	20.47	164
11.1	25.302	115	89.76	246	48.247	118	19.83	237	28.379	58	58.46	60	8.554	78	18.78	160
21.0	25.231	71	87.04	272	48.191	56	17.36	247	28.352	27	57.62	84	8.518	36	17.13	165
31.0	25.208	23	84.09	295	48.203	12	14.91	245	28.360	8	56.53	109	8.530	12	15.57	136
		30		313		85		234		47		132		62		120
Apr. 10.0	25.238		80.96		48.288		12.57		28.407		55.21		8.592		14.18	113
20.0	25.323	85	77.71	325	48.446	188	10.45	212	28.498	91	53.67	154	8.708	116	13.05	84
30.0	25.406	143	74.42	339	48.677	231	8.62	183	28.631	133	51.91	176	8.876	168	12.21	54
May 0.0	25.602	190	71.15	327	48.974	297	7.15	147	28.805	174	49.99	192	9.093	217	11.70	51
10.0	25.909	247	67.97	318	49.330	356	6.10	105	29.018	213	47.94	205	9.356	263	11.56	14
		294		300		408		60		247		216		302		24
20.0	26.203		64.07		49.738		5.50		29.265		45.78		9.658		11.80	
June 8.8	26.530	333	62.19	278	50.185	447	5.37	13	29.540	275	43.59	219	9.990	332	12.42	63
18.8	26.900	364	59.73	246	50.659	474	5.71	34	29.835	295	41.41	215	10.344	354	13.40	96
28.8	27.286	385	57.04	209	51.149	490	6.52	81	30.145	310	39.31	210	10.710	366	14.72	123
July 8.7	27.681	397	55.98	130	51.640	491	7.76	134	30.460	315	37.32	191	11.079	369	16.34	163
						484		165		311		181		363		196
18.7	28.078		54.78		52.124		9.41		30.771		35.51		11.442		18.20	
28.7	28.404	386	54.09	69	52.586	462	11.42	201	31.071	300	33.94	157	11.789	347	20.28	26
Aug. 7.7	28.828	364	53.90	19	53.020	434	13.74	232	31.353	282	32.63	131	12.116	327	22.52	234
17.6	29.162	334	54.24	34	53.417	397	16.32	288	31.610	257	31.62	101	12.414	296	24.86	234
27.6	29.456	294	55.08	84	53.771	354	19.09	277	31.840	230	30.93	69	12.679	265	27.25	239
		249		132		304		292		196		36		228		239
Sept. 6.6	29.705		56.40		54.075		22.01		32.036		30.57		12.907		29.64	
16.6	29.903	188	58.13	173	54.328	333	25.01	300	32.196	160	30.51	6	13.097	190	32.00	236
26.5	30.045	142	60.23	209	54.527	199	28.02	301	32.321	125	30.76	25	13.247	159	34.27	227
Oct. 6.5	30.133	88	62.57	233	54.673	146	31.00	298	32.410	89	31.28	53	13.358	111	36.40	233
16.5	30.166	34	65.11	234	54.764	91	33.88	288	32.465	55	32.04	76	13.431	73	38.28	198
		19		261		38		272		22		92		36		173
26.4	30.147		67.52		54.802		36.60		32.487		32.96		13.467		40.17	
Nov. 5.4	30.078	89	70.28	236	54.791	11	39.09	249	32.480	7	34.02	106	13.470	3	41.73	138
15.4	29.967	111	72.52	214	54.731	80	41.30	221	32.446	34	35.16	114	13.439	31	43.04	121
25.4	29.817	130	74.91	219	54.623	108	43.20	180	32.390	56	36.31	113	13.378	61	44.07	96
Dec. 5.3	29.688	179	76.52	182	54.477	143	44.29	149	32.312	73	37.44	115	13.290	98	44.96	71
		20		169		134		107		93		106		113		6
15.3	29.433		78.52		54.263		45.76		32.219		38.50		13.177		45.22	
25.3	29.212	231	79.22	134	54.077	215	46.37	61	32.113	126	39.44	94	13.044	123	45.29	1
35.3	28.991	221	79.26	57	53.837	260	46.48	11	31.994	119	40.25	51	12.994	139	45.33	3
Mean Place	29.466		80.77		48.178		7.46		27.880		59.52		8.114		9.98	
Sec. 2. Time	1.47		-1.07		1.723		-1.403		1.017		-0.187		1.223		-0.795	
1914-1915	-0.00		-0.07		-0.07		-0.09		-0.06		-0.01		-0.07		-0.05	
1915-1916	-0.04		-0.23		-0.24		-0.23		-0.24		-0.23		-0.24		-0.23	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Piscium. Mag. 4.7			ζ Piscium. Mag. 5.6			κ Tucanae. Mag. 5.0			f Piscium. Mag. 5.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 1 7	s 1 7	° ' " +29 39	h m 1 9	s 1 9	° ' " + 7 8	h m 1 12	s 1 12	° ' " -69 18	h m 1 13	s 1 13	° ' " + 3 10
Jan. 0.3	9.767		32.15	28.028		39.21	60.61		54.90	35.391		64.97
10.2	9.628	139	31.66 49	27.915	113	38.52 69	60.06	55	54.82 8	35.279	112	64.25 72
20.2	9.481	147	30.89 77	27.796	119	37.81 71	59.51	55	54.14 68	35.158	121	63.58 67
30.2	9.334	147	29.89 100	27.676	120	37.12 66	58.98	58	52.88 126	35.038	120	62.96 62
Feb. 9.2	9.194	140	28.69 120	27.562	114	36.46 66	58.48	50	51.08 180	34.923	115	62.42 54
		125	28.69 134		104	36.46 50		45			106	62.42 44
19.1	9.069		27.35	27.458		35.87	58.03		48.79	34.817		61.98
Mar. 1.1	8.965	104	25.93 142	27.373	85	35.38 49	57.66	37	46.07 272	34.729	88	61.67 31
11.1	8.894	71	24.49 144	27.314	59	35.02 36	57.35	31	43.00 307	34.666	63	61.53 14
21.1	8.860	34	23.09 140	27.286	28	34.85 17	57.13	22	39.64 336	34.633	33	61.59 6
31.0	8.869	9	21.82 127	27.294	8	34.87 2	57.00	13	36.07 357	34.637	4	61.83 24
		53	21.82 107		48	34.87 25		5			42	61.83 49
Apr. 10.0	8.927		20.75	27.342		35.12	56.95		32.37	34.679		62.32
20.0	9.035	108	19.90 85	27.434	92	35.61 49	57.01	6	28.62 375	34.764	85	63.05 78
29.9	9.192	157	19.36 54	27.569	135	36.37 76	57.17	16	24.91 371	34.894	130	64.03 96
May 9.9	9.398	206	19.15 21	27.747	178	37.36 99	57.44	27	21.31 360	35.066	172	65.24 121
19.9	9.646	248	19.26 11	27.963	216	38.61 125	57.79	35	17.90 341	35.274	208	66.66 142
		284	19.26 48		251	38.61 145		43			246	66.66 162
29.9	9.930		19.74	28.214		40.06	58.22		14.77	35.520		68.28
June 8.8	10.245	315	20.56 82	28.491	277	41.71 165	58.74	52	11.97 280	35.794	274	70.06 178
18.8	10.581	336	21.71 115	28.790	299	43.49 178	59.31	57	9.59 238	36.087	293	71.93 187
28.8	10.930	349	23.13 142	29.102	312	45.37 188	59.93	62	7.67 192	36.392	305	73.85 192
July 8.8	11.281	351	24.83 170	29.417	315	47.29 192	60.59	66	6.28 139	36.704	312	75.78 193
		347	24.83 190		312	47.29 192		66			311	75.78 192
18.7	11.628		26.73	29.729		49.21	61.25		5.44	37.015		77.70
28.7	11.962	334	28.79 206	30.029	300	51.07 186	61.91	66	5.18 26	37.316	301	79.50 180
Aug. 7.7	12.274	312	30.95 216	30.314	285	52.83 176	62.54	63	5.52 24	37.598	282	81.16 166
17.6	12.560	286	33.16 221	30.574	260	54.44 161	63.12	58	6.42 90	37.859	261	82.64 148
27.6	12.814	254	35.39 223	30.806	232	55.88 144	63.64	52	7.88 146	38.093	234	83.94 130
		220	35.39 219		200	55.88 122		45			203	83.94 103
Sept. 6.6	13.034		37.58	31.006		57.10	64.09		9.83	38.296		84.97
16.6	13.218	184	39.68 210	31.174	168	58.11 161	64.44	35	12.20 237	38.464	168	85.76 79
26.5	13.363	145	41.68 200	31.306	132	58.87 76	64.68	24	14.93 273	38.598	134	86.30 54
Oct. 6.5	13.471	108	43.53 185	31.405	99	59.42 55	64.82	14	17.90 297	38.700	102	86.60 30
16.5	13.542	71	45.19 166	31.471	66	59.73 31	64.85	3	21.01 311	38.769	69	86.67 7
		38	45.19 147		35	59.73 12		9			39	86.67 14
26.5	13.580		46.66	31.506		59.85	64.76		24.13	38.808		86.53
Nov. 5.4	13.586	6	47.91 125	31.513	7	59.79 6	64.57	19	27.13 300	38.816	8	86.23 30
15.4	13.561	25	48.93 102	31.493	20	59.55 24	64.29	28	29.91 278	38.799	17	85.79 44
25.4	13.509	52	49.68 75	31.450	43	59.19 36	63.92	37	32.33 242	38.757	42	85.23 56
Dec. 5.3	13.431	78	50.18 50	31.386	64	58.71 48	63.48	44	34.33 200	38.694	63	84.59 64
		100	50.18 21		81	58.71 56		49			80	84.59 71
15.3	13.331		50.39	31.305		58.15	62.99		35.82	38.614		83.88
25.3	13.211	120	50.33 6	31.207	98	57.51 64	62.45	54	36.74 92	38.516	98	83.17 71
35.3	13.076	135	49.98 35	31.098	109	56.82 69	61.90	55	37.06 32	38.406	110	82.44 73
Mean Place	8.389		16.72	26.730		31.45	59.349		42.14	34.081		58.65
Sec δ , Tan δ	1.151		+0.569	1.008		+0.125	2.830		-2.648	1.002		+0.056
$D\alpha$, D_{α}	+0.07		-0.04	+0.06		-0.01	+0.04		+0.18	+0.06		0.00
$D\delta$, D_{δ}	+0.4		+0.3	+0.4		+0.3	+0.4		+0.3	+0.4		+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Piscium. Mag. 4.7		θ Ceti. Mag. 3.8		δ Cassiopeie. Mag. 2.8		γ Phoenicis. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 14	° ' " +26 50	h m 1 19	° ' " - 8 35	h m 1 20	° ' " +59 48	h m 1 24	° ' " -43 43
Jan. 0.3	58.733	14.75	56.757	79.92	28.254	58.19	49.619	86.12
10.3	58.600 ¹³³	14.26 ⁴⁹	56.639 ¹¹⁸	80.66 ⁷⁴	27.949 ³⁰⁵	58.37 ¹⁸	49.406 ²¹³	86.67 ⁵⁶
20.2	58.459 ¹⁴¹	13.53 ⁷³	56.514 ¹²⁵	81.24 ⁵⁸	27.628 ³²¹	58.02 ³⁵	49.187 ²¹⁹	86.74 ⁷
30.2	58.316 ¹⁴³	12.60 ⁹³	56.388 ¹²⁶	81.64 ⁴⁰	27.304 ³²⁴	57.15 ⁸⁷	48.971 ²¹⁶	86.32 ⁴²
Feb. 9.2	58.177 ¹³⁹	11.50 ¹¹⁰	56.265 ¹²³	81.84 ²⁰	26.994 ³¹⁰	55.81 ¹³⁴	48.765 ²⁰⁶	85.41 ⁹¹
19.1	58.051 ¹²⁶	10.28 ¹²²	56.153 ¹¹²	81.84 ⁰	26.710 ²⁸⁴	54.05 ¹⁷⁶	48.575 ¹⁹⁰	84.08 ¹²³
Mar. 1.1	57.945 ¹⁰⁶	8.99 ¹²⁹	56.057 ⁹⁶	81.61 ²³	26.470 ²⁴⁰	51.94 ²¹¹	48.409 ¹⁶⁶	82.33 ¹⁷⁵
11.1	57.869 ⁷⁶	7.69 ¹³⁰	55.985 ⁷²	81.16 ⁴⁵	26.287 ¹⁸³	49.59 ²³⁵	48.276 ¹³³	80.20 ²¹³
21.1	57.830 ³⁹	6.45 ¹²⁴	55.942 ⁴³	80.45 ⁷¹	26.172 ¹¹⁵	47.08 ²⁵¹	48.181 ⁹⁵	77.75 ²⁴⁵
31.0	57.832 ²	5.35 ¹¹⁰	55.935 ⁷	79.52 ⁹³	26.136 ³⁶	44.52 ²⁵⁶	48.131 ⁵⁰	75.03 ²⁷²
Apr. 10.0	57.880 ⁴⁸	4.42 ⁹³	55.967 ³²	78.33 ¹¹⁹	26.183 ⁴⁷	42.01 ²⁵¹	48.131 ⁰	72.08 ²⁹⁵
20.0	57.978 ⁹⁸	3.73 ⁶⁹	56.042 ⁷⁵	76.92 ¹⁴¹	26.316 ¹³³	39.66 ²³⁵	48.184 ⁵³	68.97 ³¹¹
30.0	58.124 ¹⁴⁶	3.32 ⁴¹	56.160 ¹¹⁸	75.29 ¹⁶³	26.531 ²¹⁵	37.57 ²⁰⁹	48.291 ¹⁰⁷	65.77 ³²⁰
May 9.9	58.317 ¹⁹³	3.22 ¹⁰	56.321 ¹⁶¹	73.48 ¹⁸¹	26.827 ²⁰⁶	35.81 ¹⁷⁶	48.452 ¹⁶¹	62.54 ³²²
19.9	58.553 ²³⁶	3.45 ²³	56.522 ²⁰¹	71.52 ¹⁹⁶	27.193 ³⁶⁶	34.42 ¹³⁹	48.664 ²¹²	59.36 ³¹¹
29.9	58.827 ²⁷⁴	4.01 ⁵⁶	56.757 ²³⁵	69.45 ²⁰⁷	27.623 ⁴³⁰	33.48 ⁹⁴	48.924 ²⁶⁰	56.30 ³⁰⁴
June 8.8	59.131 ³⁰⁴	4.88 ⁸⁷	57.022 ²⁶⁵	67.31 ²¹⁴	28.099 ⁴⁷⁶	33.01 ⁴⁷	49.224 ³⁰⁰	53.42 ²⁸⁶
18.8	59.457 ³²⁶	6.06 ¹¹⁴	57.310 ²⁸⁸	65.16 ²¹⁵	28.613 ⁵¹⁴	33.02 ¹	49.557 ³³³	50.81 ²⁶
28.8	59.796 ³³⁹	7.50 ¹⁴⁸	57.614 ³⁰⁴	63.07 ²⁰⁹	29.149 ⁵³⁶	33.51 ⁴⁹	49.916 ³⁵⁹	48.52 ²²
July 8.8	60.141 ³⁴⁵	9.18 ¹⁶⁸	57.925 ³¹¹	61.07 ²⁰⁰	29.694 ⁵⁴⁵	34.45 ⁹⁴	50.289 ³⁷³	46.63 ¹³⁹
18.7	60.482 ³⁴¹	11.03 ¹⁸⁵	58.235 ³¹⁰	59.22 ¹⁸⁵	30.233 ⁵³⁹	35.84 ¹³⁹	50.668 ³⁷⁹	45.17 ¹⁴
28.7	60.811 ³²⁹	13.02 ¹⁹⁹	58.536 ³⁰¹	57.60 ¹⁶²	30.758 ⁵²⁵	37.63 ¹⁷⁹	51.040 ³⁷²	44.19 ⁹
Aug. 7.7	61.121 ³¹⁰	15.09 ²⁰⁷	58.823 ²⁸⁷	56.21 ¹³⁹	31.254 ⁴⁹⁶	37.79 ²¹⁶	51.396 ³⁵⁶	43.71 ⁴
17.7	61.407 ²⁸⁶	17.21 ²¹²	59.087 ²⁶⁴	55.11 ¹¹⁰	31.712 ⁴⁵⁸	42.26 ²⁴⁷	51.729 ³³³	43.77 ¹
27.6	61.662 ²⁵⁵	19.30 ²⁰⁹	59.325 ²³⁸	54.31 ⁸⁰	32.126 ⁴¹⁴	44.97 ²⁷¹	52.028 ²⁹⁹	44.33 ⁵⁴
Sept. 6.6	61.885 ²²³	21.35 ²⁰⁵	59.532 ²⁰⁷	53.82 ⁴⁹	32.489 ³⁶³	47.88 ²⁹¹	52.288 ²⁶⁰	45.38 ¹⁰¹
16.6	62.073 ¹⁸⁸	23.31 ¹⁹⁶	59.705 ¹⁷³	53.67 ¹⁵	32.796 ³⁰⁷	50.94 ³⁰⁶	52.503 ²¹⁵	46.88 ¹⁵⁰
26.5	62.224 ¹⁵¹	25.14 ¹⁸³	59.845 ¹⁴⁰	53.81 ¹⁴	33.045 ²⁴⁹	54.07 ³¹³	52.669 ¹⁶⁶	48.76 ¹⁸⁸
Oct. 6.5	62.339 ¹¹⁵	26.81 ¹⁶⁷	59.949 ¹⁰⁴	54.22 ⁴¹	33.231 ¹⁸⁶	57.22 ³¹⁵	52.785 ¹¹⁶	50.96 ²²⁰
16.5	62.419 ⁸⁰	28.31 ¹⁵⁰	60.019 ⁷⁰	54.88 ⁶⁶	33.357 ¹²⁶	60.32 ³¹⁰	52.849 ⁶⁴	53.39 ²⁴³
26.5	62.467 ⁴⁸	29.62 ¹³¹	60.059 ⁴⁰	55.72 ⁸⁴	33.422 ⁶⁵	63.30 ²⁹⁸	52.865 ¹⁶	55.96 ²⁵
Nov. 5.4	62.482 ¹⁵	30.71 ¹⁰⁹	60.067 ⁸	56.71 ⁹⁹	33.425 ³	66.11 ²⁸¹	52.834 ³¹	58.54 ²⁶¹
15.4	62.466 ¹⁶	31.59 ⁸⁸	60.048 ¹⁹	57.80 ¹⁰⁹	33.368 ⁵⁷	68.67 ²⁵⁶	52.760 ⁷⁴	61.04 ²⁵¹
25.4	62.424 ⁴²	32.22 ⁶³	60.005 ⁴³	58.92 ¹¹²	33.255 ¹¹³	70.93 ²²⁶	52.647 ¹¹³	63.38 ²³
Dec. 5.4	62.356 ⁶⁸	32.62 ⁴⁰	59.938 ⁶⁷	60.04 ¹¹²	33.088 ¹⁶⁷	72.82 ¹⁸⁹	52.502 ¹⁴⁵	65.43 ²⁰¹
15.3	62.265 ⁹¹	32.76 ¹⁴	59.853 ⁸⁵	61.10 ¹⁰⁶	32.871 ²¹⁷	74.28 ¹⁴⁶	52.331 ¹⁷¹	67.14 ¹⁷
25.3	62.153 ¹¹²	32.65 ¹¹	59.752 ¹⁰¹	62.08 ⁹⁸	32.611 ²⁶⁰	75.27 ⁹⁹	52.137 ¹⁹⁴	68.45 ¹³
35.3	62.025 ¹²⁸	32.29 ³⁶	59.637 ¹¹⁵	62.93 ⁸⁵	32.317 ²⁹⁴	75.76 ⁴⁹	51.927 ²¹⁰	69.31 ⁸
Mean Place	57.311	0.34	55.442	82.05	26.346	35.06	48.322	77.77
Sec δ , Tan δ	1.121	+0.506	1.011	-0.151	1.989	+1.719	1.384	-0.957
$D\psi\alpha$, $D\mu\alpha$	+0.06	-0.03	+0.06	+0.01	+0.08	-0.11	+0.05	+0.06
$D\psi\delta$, $D\mu\delta$	+0.4	+0.3	+0.4	+0.3	+0.4	+0.3	+0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	38 Cassiopeiæ. Mag. 6.0		7 Piscium. Mag. 3.7		40 Cassiopeiæ. Mag. 5.5		U Andromedæ. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 25	° ' " +69 50	h m 1 27	° ' " +14 55	h m 1 31	° ' " +72 37	h m 1 31	° ' " +40 59
	s 1 25	" +69 50	s 1 27	" +14 55	s 1 31	" +72 37	s 1 31	" +40 59
Jan. 0.3	8.66	60.23	6.983	34.89	58.86	47.01	60.346	63.24
10.3	8.17	60.70	6.867	34.30	58.29	47.64	60.177	63.11
20.2	7.66	60.59	6.741	33.60	57.68	47.66	59.995	62.61
30.2	7.15	59.90	6.611	32.83	57.07	47.10	59.806	61.76
Feb. 9.2	6.65	58.66	6.483	32.02	56.48	45.97	59.619	60.59
19.1	6.19	56.92	6.365	31.20	55.93	44.32	59.447	59.15
Mar. 1.1	5.80	54.76	6.263	30.41	55.46	42.21	59.296	57.50
11.1	5.51	52.28	6.185	29.70	55.09	39.75	59.180	55.73
21.1	5.30	49.58	6.138	29.09	54.82	37.04	59.105	53.89
31.0	5.21	46.76	6.130	28.65	54.68	34.19	59.080	52.09
Apr. 10.0	5.24	43.95	6.163	28.42	54.69	31.30	59.110	50.40
20.0	5.40	41.24	6.241	28.41	54.84	28.51	59.197	48.88
30.0	5.67	38.76	6.365	28.66	55.13	25.91	59.344	47.62
May 9.9	6.06	36.59	6.534	29.18	55.54	23.59	59.546	46.66
19.9	6.55	34.79	6.744	29.08	56.09	21.64	59.800	46.06
29.9	7.12	33.43	6.990	31.02	56.73	20.12	60.099	45.82
June 8.8	7.77	32.54	7.266	32.31	57.45	19.06	60.434	45.97
18.8	8.48	32.16	7.567	33.80	58.23	18.51	60.799	46.50
28.8	9.21	32.30	7.881	35.46	59.06	18.48	61.182	47.39
July 8.8	9.96	32.94	8.203	37.24	59.91	18.98	61.574	48.64
18.7	10.71	34.08	8.525	39.09	60.76	19.97	61.965	50.20
28.7	11.44	35.68	8.837	40.96	61.59	21.43	62.346	52.01
Aug. 7.7	12.12	37.70	9.134	42.81	62.39	23.32	62.709	54.05
17.7	12.77	40.09	9.410	44.60	63.13	25.62	63.046	56.26
27.6	13.35	42.82	9.658	46.26	63.81	28.28	63.353	58.59
Sept. 6.6	13.86	45.82	9.877	47.78	64.42	31.22	63.624	60.99
16.6	14.30	49.01	10.065	49.14	64.93	34.39	63.859	63.42
26.5	14.65	52.34	10.218	50.31	65.35	37.73	64.053	65.82
Oct. 6.5	14.92	55.75	10.338	51.29	65.67	41.17	64.206	68.16
16.5	15.09	59.16	10.426	52.05	65.89	44.64	64.319	70.39
26.5	15.17	62.51	10.482	52.63	65.99	48.07	64.393	72.46
Nov. 5.4	15.16	65.70	10.509	53.01	65.99	51.38	64.427	74.35
15.4	15.06	68.67	10.508	53.20	65.89	54.48	64.424	76.01
25.4	14.87	71.34	10.480	53.23	65.68	57.31	64.384	77.42

APPARENT PLACES OF STARS. 1918.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Piscium. Mag. 5.6		υ Persel. Mag. 3.8		α Eridani. (Achernar.) Mag. 0.6		γ Cassiopeiæ. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 32	° ' " +11 43	h m 1 32	° ' " +48 12	h m 1 34	° ' " -57 38	h m 1 36	° ' " +67 37
	s 1 32	" +11 43	s 1 32	" +48 12	s 1 34	" -57 38	s 1 36	" +67 37
Jan. 0.3	46.388	29.81	58.832	67.75	41.088	82.47	17.33	68.12
10.3	46.274 ¹¹⁴	29.20 ⁶¹	58.631 ²⁰¹	67.79 ⁴	40.756 ³³²	82.92 ⁴⁵	16.91 ⁴²	68.68 ⁵⁶
20.2	46.151 ¹²³	28.52 ⁶⁸	58.411 ²²⁰	67.40 ³⁹	40.417 ³³⁹	82.81 ¹¹	16.44 ⁴⁷	68.66 ²
30.2	46.023 ¹²⁸	27.80 ⁷²	58.186 ²²⁵	66.59 ⁸¹	40.082 ³³⁵	82.14 ⁶⁷	15.98 ⁴⁶	68.08 ⁵⁸
Feb. 9.2	45.895 ¹²⁸	27.07 ⁷³	57.964 ²²²	65.39 ¹²⁰	39.760 ³²²	80.94 ¹²⁰	15.54 ⁴⁴	66.96 ¹¹²
	119	60	205	153	297	170	41	161
19.2	45.776	26.38	57.759	63.86	39.463	79.24	15.13	65.35
Mar. 1.1	45.672 ¹⁰⁴	25.73 ⁶⁵	57.581 ¹⁷⁸	62.06 ¹⁸⁰	39.199 ²⁶⁴	77.07 ²¹⁷	14.76 ³⁷	63.31 ²⁰⁴
11.1	45.591 ⁸¹	25.17 ⁵⁶	57.440 ¹⁴¹	60.07 ¹⁹⁹	38.978 ²²¹	74.51 ²⁵⁶	14.46 ³⁰	60.94 ²³⁷
21.1	45.540 ⁵¹	24.74 ⁴³	57.349 ⁹¹	57.97 ²¹⁰	38.808 ¹⁷⁰	71.62 ²⁸⁹	14.26 ²⁰	58.33 ²⁶¹
31.0	45.526 ¹⁴	24.50 ²⁴	57.315 ³⁴	55.86 ²¹¹	38.697 ¹¹¹	68.43 ³¹⁹	14.16 ¹⁰	55.60 ³⁷³
	26	5	28	203	47	338	0	274
Apr. 10.0	45.552	24.45	57.343	53.83	38.650	65.05	14.16	52.86
20.0	45.623 ⁷¹	24.64 ¹⁹	57.437 ⁹⁴	51.96 ¹⁸⁷	38.672 ²²	61.53 ³⁵²	14.28 ¹²	50.21 ²⁶⁵
30.0	45.739 ¹¹⁶	25.06 ⁴²	57.596 ¹⁵⁹	50.34 ¹⁶²	38.765 ⁹³	57.96 ³⁵⁷	14.51 ²³	47.75 ²⁴⁶
May 9.9	45.899 ¹⁰⁰	25.75 ⁶⁹	57.818 ²²²	49.02 ¹³²	38.927 ¹⁶²	54.41 ³⁵⁶	14.84 ³³	45.58 ²¹⁷
19.9	46.100 ²⁰¹	26.68 ⁹³	58.098 ²⁸⁰	48.06 ⁹⁶	39.157 ²³⁰	50.96 ³⁴⁵	15.27 ⁴³	43.77 ¹⁸¹
	237	118	330	57	293	327	52	140
29.9	46.337	27.86	58.428	47.49	39.450	47.69	15.79	42.37
June 8.9	46.607 ²⁷⁰	29.25 ¹³⁹	58.799 ³⁷¹	47.34 ¹⁵	39.799 ³⁴⁹	44.68 ³⁰¹	16.37 ⁵⁸	41.44 ⁹²
18.8	46.900 ²⁹³	30.82 ¹⁵⁷	59.202 ⁴⁰³	47.61 ²⁷	40.195 ³⁹⁶	42.00 ²⁶⁸	17.01 ⁶⁴	41.00 ⁶
28.8	47.210 ³¹⁰	32.53 ¹⁷¹	59.625 ⁴²³	48.29 ⁶⁸	40.628 ⁴³³	39.71 ²²⁹	17.68 ⁰⁷	41.06 ⁴
July 8.8	47.527 ⁸¹⁷	34.33 ¹⁸⁰	60.058 ⁴³³	49.36 ¹⁰⁷	41.084 ⁴⁵⁶	37.89 ¹⁸²	18.37 ⁶⁹	41.61 ⁵⁵
	317	184	432	143	469	132	69	103
18.7	47.844 ³¹⁰	36.17 ¹⁸⁴	60.490 ⁴²¹	50.79 ¹⁷⁶	41.553 ⁴⁶⁸	36.57 ⁷⁸	19.06 ⁶⁷	42.64 ¹⁴⁸
28.7	48.154 ²⁹⁶	38.01 ¹⁷⁸	60.911 ⁴⁰²	52.55 ²⁰⁵	42.021 ⁴⁵⁵	35.79 ²¹	19.73 ⁶⁵	44.12 ¹⁸⁹
Aug. 7.7	48.450 ²⁷⁵	39.79 ¹⁶⁸	61.313 ³⁷⁵	54.60 ²²⁷	42.476 ⁴²⁵	35.58 ³⁷	20.38 ⁶¹	46.01 ²²⁸
17.7	48.725 ²³⁰	41.47 ¹⁵⁵	61.688 ³⁴¹	56.87 ²⁴⁶	42.901 ³⁸⁸	35.95 ⁹³	20.99 ⁵⁶	48.29 ²⁹⁰
27.6	48.975 ²²¹	43.02 ¹³⁹	62.029 ³⁰³	59.33 ²⁵⁹	43.289 ³⁴⁰	36.88 ¹⁴⁶	21.55 ⁴⁸	50.89 ²⁸⁶
Sept. 6.6	49.196 ¹⁹⁰	44.41 ¹¹⁹	62.332 ²⁶⁰	61.92 ²⁶⁶	43.629 ²⁸¹	38.34 ¹⁹⁴	22.03 ⁴³	53.75 ³⁰⁸
16.6	49.386 ¹⁵⁶	45.60 ⁹⁹	62.592 ²¹⁷	64.58 ²⁶⁸	43.910 ²¹⁷	40.28 ²³³	22.46 ³⁵	56.83 ³²²
26.6	49.542 ¹²⁴	46.59 ⁷⁷	62.809 ¹⁷¹	67.26 ²⁶⁶	44.127 ¹⁴⁸	42.61 ²⁶⁷	22.81 ²⁸	60.05 ³³⁰
Oct. 6.5	49.666 ⁹²	47.36 ⁵⁷	62.980 ¹²⁶	69.92 ²⁵⁷	44.275 ⁷⁸	45.28 ²⁸⁸	23.09 ²⁰	63.35 ³³²
16.5	49.758 ⁶⁰	47.93 ³⁷	63.106 ⁷⁹	72.49 ²⁴⁶	44.353 ⁸	48.16 ²⁹⁹	23.29 ¹¹	66.67 ³²⁷
26.5	49.818 ³¹	48.30 ¹⁷	63.185 ³⁵	74.95 ²²⁷	44.361 ⁵⁹	51.15 ²⁹⁸	23.40 ²	69.94 ³¹⁴
Nov. 5.4	49.849 ³	48.47 ¹	63.220 ⁸	77.22 ²⁰⁵	44.302 ¹²³	54.13 ²⁸⁵	23.42 ⁶	73.08 ²⁹³
15.4	49.852 ²³	48.48 ¹⁴	63.212 ⁵²	79.27 ¹⁷⁹	44.179 ¹⁸⁰	56.98 ²⁶¹	23.36 ¹³	76.01 ²⁶⁶
25.4	49.829 ⁴⁷	48.34 ²⁹	63.160 ⁹¹	81.06 ¹⁴⁶	43.999 ²²⁹	59.59 ²²⁷	23.23 ²¹	78.67 ²³³
Dec. 5.4	49.782 ⁷⁰	48.05 ³⁹	63.069 ¹³⁰	82.52 ¹¹⁰	43.770 ²⁷¹	61.86 ¹⁸⁵	23.02 ²⁹	80.99 ¹⁹⁹
15.3	49.712	47.66	62.939	83.62	43.499	63.71	22.73	82.88
25.3	49.622 ⁹⁰	47.16 ⁵⁰	62.775 ¹⁶⁴	84.33 ⁷¹	43.195 ³⁰⁴	65.07 ¹³⁶	22.38 ³⁵	84.28 ¹⁴⁰
35.3	49.515 ¹⁰⁷	46.57 ⁵⁹	62.584 ¹⁹¹	84.62 ²⁹	42.871 ³²⁴	65.89 ⁸²	21.97 ⁴¹	85.16 ⁸⁸
Mean Place	44.927	20.81	57.025	47.57	39.688	71.35	14.815	44.11
Sec δ , Tan δ	1.021	+0.208	1.501	+1.119	1.869	-1.579	2.628	+2.430
D ϕ α , D ω α	+0.06	-0.01	+0.07	-0.07	+0.04	+0.10	+0.09	-0.15
D ϕ δ , D ω δ	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4

329

Washington in Time.	♌ Piscium. Mag. 4.7		♍ Persei. Mag. 4.2		♎ Ceti. Mag. 3.6		♏ Piscium. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 37	° ' " + 5 4	h m 1 38	° ' " +50 16	h m 1 40	° ' " -16 21	h m 1 41	° ' " + 8 44
	s 11.194	" 29.88	s 32.616	" 54.82	s 16.870	" 68.56	s 5.180	" 51.48
n. 0.3	110 11.084	60 29.19	212 32.404	14 54.96	129 16.741	78 69.34	100 5.071	60 50.84
10.3	123 10.962	63 28.51	231 32.173	30 54.66	140 16.601	54 69.88	123 4.948	67 50.17
20.2	126 10.836	63 27.88	240 31.933	73 53.93	143 16.458	27 70.15	129 4.819	67 49.50
30.2	127 10.709	58 27.30	237 31.696	115 52.78	142 16.316	0 70.15	129 4.690	65 48.85
b. 9.2	119 10.590	49 26.81	221 31.475	150 51.28	134 16.182	30 69.85	122 4.568	60 48.25
19.2	106 10.484	38 26.43	195 31.280	179 49.49	118 16.064	58 69.27	109 4.459	53 47.72
ar. 1.1	82 10.402	23 26.20	155 31.125	201 47.48	97 15.967	84 68.43	88 4.371	41 47.31
11.1	56 10.346	7 26.13	104 31.021	214 45.34	67 15.900	113 67.30	58 4.313	26 47.05
21.1	19 10.327	13 26.26	45 30.976	218 43.16	32 15.868	139 65.91	22 4.291	9 46.96
31.0	19 10.346	34 26.60	19 30.995	211 41.05	8 15.876	165 64.26	18 4.309	13 47.09
pr. 10.0	65 10.411	57 27.17	89 31.084	197 39.08	50 15.926	186 62.40	62 4.371	35 47.44
20.0	107 10.518	82 27.99	155 31.239	174 37.34	94 16.020	206 60.34	106 4.477	59 48.03
30.0	132 10.670	105 29.04	222 31.461	145 35.89	139 16.159	221 58.13	151 4.628	83 48.86
ay 9.9	191 10.861	127 30.31	283 31.744	109 34.80	182 16.341	233 55.80	193 4.821	108 49.94
19.9	229 11.090	147 31.78	335 32.079	20 34.10	220 16.561	230 53.41	229 5.050	129 51.23
29.9	262 11.352	165 33.43	379 32.458	79 33.81	252 16.813	240 51.01	262 5.312	148 52.71
ne 8.9	284 11.636	176 35.19	413 32.871	14 33.95	278 17.091	236 48.65	284 5.598	174 54.35
18.8	302 11.938	184 37.03	437 33.308	55 34.50	297 17.388	224 46.41	306 5.902	165 56.10
28.8	313 12.251	188 38.91	447 33.755	96 35.46	309 17.697	207 44.34	314 6.216	181 57.91
ly 8.8	313 12.564	186 40.77	447 34.202	134 36.80	312 18.009	185 42.49	315 6.531	183 59.74
18.7	305 12.869	179 42.56	438 34.640	166 38.48	305 18.314	158 40.91	308 6.839	180 61.54
28.7	293 13.162	167 44.23	420 35.060	199 40.47	294 18.608	125 39.66	296 7.135	172 63.26
ug. 7.7	273 13.435	150 45.73	392 35.452	223 42.70	274 18.882	91 38.75	278 7.413	158 64.84
17.7	249 13.684	132 47.05	359 35.811	243 45.13	249 19.131	54 38.21	252 7.665	144 66.28
27.6	220 13.904	109 48.14	320 36.131	259 47.72	219 19.350	16 38.05	226 7.891	123 67.51
pt. 6.6	190 14.094	86 49.00	278 36.409	268 50.40	188 19.538	21 38.26	195 8.086	103 68.54
16.6	157 14.25							

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Sculptoris. Mag. 5.4		ζ Ceti. Mag. 3.9		α Trianguli. Mag. 3.6		ϵ Cassiopeia. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 41	° ' -25 27	h m 1 47	° ' -10 43	h m 1 48	° ' +29 10	h m 1 48	° ' +63 15
	s	"	s	"	s	"	s	"
Jan. 0.3	49.497	46.23	26.205	81.41	25.851	62.11	31.25	83.87
10.3	49.354 ¹⁴³	47.07 ⁸⁴	26.087 ¹¹⁸	82.25 ⁸⁴	25.722 ¹²⁹	61.84 ²⁷	30.91 ³⁴	84.45 ⁵⁸
20.2	49.201 ¹⁵³	47.58 ⁵¹	25.958 ¹²⁹	82.90 ⁶⁵	25.577 ¹⁴⁵	61.33 ⁵¹	30.55 ³⁶	84.50 ⁵
30.2	49.044 ¹⁵⁷	47.74 ¹⁶	25.823 ¹³⁵	83.35 ⁴⁵	25.422 ¹⁵⁵	60.58 ⁷⁵	30.17 ³⁸	84.01 ⁴⁰
Feb. 9.2	48.887 ¹⁵⁷	47.54 ²⁰	25.686 ¹³⁷	83.56 ²¹	25.265 ¹⁵⁷	59.65 ⁹³	29.79 ³⁸	83.01 ¹⁰⁰
19.2	48.739 ¹⁴⁸	46.98 ⁵⁶	25.555 ¹³¹	83.55 ¹	25.115 ¹⁵⁰	58.55 ¹¹⁰	29.44 ³⁵	81.53 ¹⁴⁵
Mar. 1.1	48.608 ¹³¹	46.08 ⁹⁰	25.439 ¹¹⁶	83.29 ²⁶	24.981 ¹³⁴	57.32 ¹²³	29.13 ³¹	79.66 ¹⁸⁷
11.1	48.500 ¹⁰⁸	44.86 ¹²²	25.341 ⁹⁸	82.78 ⁵¹	24.873 ¹⁰⁸	56.05 ¹²⁷	28.87 ²⁶	77.45 ²²¹
21.1	48.421 ⁷⁹	43.32 ¹⁵⁴	25.272 ⁶⁹	82.01 ⁷⁷	24.798 ⁷⁵	54.78 ¹²⁷	28.69 ¹⁸	75.01 ³⁴⁴
31.1	48.379 ⁴²	41.51 ¹⁸¹	25.237 ³⁵	81.00 ¹⁰¹	24.764 ³⁴	53.58 ¹²⁰	28.59 ¹⁰	72.43 ²⁵⁸
Apr. 10.0	48.377 ²	39.43 ²⁰⁸	25.241 ⁴	79.74 ¹²⁶	24.777 ¹³	52.50 ¹⁰⁸	28.57 ²	69.84 ²⁵⁹
20.0	48.421 ⁴⁴	37.14 ²²⁹	25.286 ⁴⁵	78.25 ¹⁴⁹	24.839 ⁶²	51.61 ⁸⁹	28.65 ⁸	67.32 ²⁵²
30.0	48.510 ⁸⁹	34.67 ²⁴⁷	25.376 ⁹⁰	76.54 ¹⁷¹	24.953 ¹¹⁴	50.97 ⁶⁴	28.83 ¹⁸	64.98 ²⁹⁴
May 9.9	48.646 ¹³⁶	32.08 ²⁵⁹	25.510 ¹³⁴	74.65 ¹⁸⁹	25.118 ¹⁶⁵	50.59 ³⁸	29.10 ²⁷	62.91 ²⁰⁷
19.9	48.827 ¹⁸¹	29.41 ²⁶⁷	25.686 ¹⁷⁶	72.60 ²⁰⁵	25.329 ²¹¹	50.51 ⁸	29.46 ³⁶	61.17 ¹⁷⁴
29.9	49.049 ²²²	26.72 ²⁶⁹	25.901 ²¹⁵	70.45 ²¹⁵	25.583 ²⁵⁴	50.75 ²⁴	29.89 ⁴³	59.83 ¹⁹¹
June 8.9	49.306 ²⁵⁷	24.09 ²⁶³	26.149 ²⁴⁸	68.25 ²²⁰	25.873 ²⁹⁰	51.29 ⁵⁴	30.38 ⁴⁹	58.92 ⁹¹
18.8	49.591 ²⁸⁵	21.58 ²⁵¹	26.423 ²⁷⁴	66.04 ²²¹	26.190 ³¹⁷	52.14 ⁸⁵	30.92 ⁵⁴	58.48 ⁴¹
28.8	49.898 ³⁰⁷	19.23 ²³⁵	26.717 ²⁹⁴	63.88 ²¹⁶	26.526 ³³⁶	53.27 ¹¹³	31.50 ⁵⁸	58.51 ³
July 8.8	50.218 ³²⁰	17.14 ²⁰⁹	27.024 ³⁰⁷	61.85 ²⁰³	26.873 ³⁴⁷	54.63 ¹³⁶	32.09 ⁵⁹	59.01 ⁵⁰
18.8	50.543 ³²⁵	15.34 ¹⁸⁰	27.334 ³¹⁰	59.97 ¹⁸⁸	27.223 ³⁵⁰	56.22 ¹⁵⁹	32.69 ⁶⁰	59.95 ⁹⁴
28.7	50.863 ³²⁰	13.89 ¹⁴⁵	27.640 ³⁰⁶	58.32 ¹⁶⁵	27.567 ³⁴⁴	57.96 ¹⁷⁴	33.29 ⁶⁰	61.34 ¹³⁹
Aug. 7.7	51.172 ³⁰⁹	12.83 ¹⁰⁶	27.935 ²⁹⁵	56.92 ¹⁴⁰	27.898 ³³¹	59.82 ¹⁸⁶	33.86 ⁵⁷	63.13 ¹⁷⁹
17.7	51.464 ²⁹²	12.17 ⁶⁶	28.213 ²⁷⁸	55.84 ¹⁰⁸	28.209 ³¹¹	61.75 ¹⁹³	34.40 ⁵⁴	65.27 ²¹⁴
27.6	51.729 ²⁶⁵	11.96 ²¹	28.468 ²⁶⁵	55.08 ⁷⁶	28.495 ²⁸⁶	63.71 ¹⁹⁶	34.90 ⁵⁰	67.70 ²⁴³
Sept. 6.6	51.965 ²³⁶	12.18 ²²	28.696 ²²⁸	54.65 ⁴³	28.751 ²⁵⁶	65.66 ¹⁹⁵	35.35 ⁴⁵	70.40 ²⁷⁰
16.6	52.166 ²⁰¹	12.81 ⁶³	28.893 ¹⁹⁷	54.58 ⁷	28.975 ²²⁴	67.55 ¹⁸⁹	35.75 ⁴⁰	73.30 ²⁹⁰
26.6	52.331 ¹⁶⁵	13.81 ¹⁰⁰	29.057 ¹⁶⁴	54.82 ²⁴	29.167 ¹⁹²	69.36 ¹⁸¹	36.07 ³²	76.34 ³⁰⁴
Oct. 6.5	52.458 ¹²⁷	15.15 ¹³⁴	29.187 ¹³⁰	55.36 ⁵⁴	29.323 ¹⁵⁶	71.06 ¹⁷⁰	36.34 ²⁷	79.46 ³¹²
16.5	52.547 ⁸⁹	16.76 ¹⁶¹	29.286 ⁹⁹	56.17 ⁸¹	29.446 ¹²³	72.60 ¹⁵⁴	36.54 ²⁰	82.60 ³¹⁴
26.5	52.599 ⁵²	18.56 ¹⁸⁰	29.351 ⁶⁵	57.18 ¹⁰¹	29.533 ⁸⁷	73.99 ¹³⁹	36.67 ¹³	85.67 ³⁰⁷
Nov. 5.5	52.615 ¹⁶	20.48 ¹⁹²	29.385 ³⁴	58.36 ¹¹⁸	29.587 ⁵⁴	75.20 ¹²¹	36.74 ⁷	88.65 ²⁹⁵
15.4	52.598 ¹⁷	22.44 ¹⁰⁶	29.391 ⁶	59.63 ¹²⁷	29.608 ²¹	76.22 ¹⁰²	36.73 ¹	91.45 ²⁸⁰
25.4	52.552 ⁴⁶	24.35 ¹⁹¹	29.367 ²⁴	60.95 ¹³²	29.598 ¹⁰	77.04 ⁸²	36.65 ⁸	93.98 ²⁵³
Dec. 5.4	52.477 ⁷⁵	26.14 ¹⁷⁹	29.320 ⁴⁷	62.24 ¹²⁹	29.558 ⁴⁰	77.63 ⁵⁹	36.50 ¹⁵	96.19 ²²¹
15.3	52.377 ¹²¹	27.73 ¹³⁵	29.247 ⁷³	63.47 ¹²³	29.487 ⁷¹	78.00 ³⁷	36.29 ²¹	98.02 ¹⁸³
25.3	52.256 ¹²¹	29.08 ¹³⁵	29.155 ⁹²	64.58 ¹¹¹	29.391 ⁹⁶	78.11 ¹¹	36.03 ²⁶	99.41 ¹³⁹
35.3	52.119 ¹³⁷	30.14 ¹⁰⁶	29.043 ¹¹²	65.55 ⁹⁷	29.270 ¹²¹	77.97 ¹⁴	35.71 ³²	100.30 ⁸⁹
Mean Place	48.095	42.78	24.744	82.57	24.160	47.73	28.774	61.03
Sec δ , Tan δ	1.108	-0.476	1.018	-0.190	1.145	+0.559	2.223	+1.986
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.06	+0.03	+0.06	+0.01	+0.07	-0.03	+0.08	-0.12
$D_{\psi} \delta$, $D_{\omega} \delta$	+0.4	+0.4	+0.4	+0.5	+0.4	+0.5	+0.4	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Piscium. Mag. 4.8		β Arietis. Mag. 2.7		ψ Phoenicis. Mag. 4.4		ν Ceti. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 49	° ' " + 2 46	h m 1 50	° ' " + 20 24	h m 1 50	° ' " - 46 41	h m 1 56	° ' " - 21 27
Jan. 0.3	20.045	65.25	7.993	39.26	22.870	84.14	9.928	90.91
10.3	19.937 ¹⁰⁸	64.53 ⁷²	7.877 ¹¹⁶	38.83 ⁴³	22.638 ²³²	84.95 ⁸¹	9.795 ¹³³	91.86 ⁹⁵
20.2	19.815 ¹²²	63.86 ⁶⁷	7.747 ¹³⁰	38.25 ⁵⁸	22.395 ²⁴³	85.25 ³⁰	9.650 ¹⁴⁵	92.50 ⁶⁴
30.2	19.685 ¹³⁰	63.25 ⁶¹	7.607 ¹⁴⁰	37.52 ⁷³	22.148 ²⁴⁷	85.03 ²²	9.497 ¹⁵³	92.81 ³¹
Feb. 9.2	19.554 ¹³¹	62.72 ⁵³	7.465 ¹⁴²	36.70 ⁸²	21.905 ²⁴³	84.31 ⁷²	9.343 ¹⁵⁴	92.81 ⁰
19.2	19.428 ¹²⁶	62.30 ⁴²	7.328 ¹³⁷	35.80 ⁹⁰	21.675 ²³⁰	83.12 ¹¹⁹	9.194 ¹⁴⁹	92.48 ³³
Mar. 1.1	19.315 ¹¹³	62.02 ²⁸	7.206 ¹²²	34.87 ⁹³	21.467 ²⁰⁸	81.47 ¹⁶⁵	9.058 ¹³⁶	91.82 ⁶⁶
11.1	19.222 ⁹³	61.89 ¹³	7.106 ¹⁰⁰	33.95 ⁹²	21.289 ¹⁷⁸	79.41 ²⁰⁶	8.943 ¹¹⁵	90.85 ⁹⁷
21.1	19.157 ⁶⁵	61.94 ⁵	7.037 ⁶⁹	33.10 ⁸⁵	21.148 ¹⁴¹	77.00 ²⁴¹	8.855 ⁸⁸	89.56 ¹²⁹
31.1	19.126 ³¹	62.19 ²⁵	7.005 ³²	32.37 ⁷³	21.053 ⁹⁵	74.27 ²⁷³	8.802 ⁵³	87.99 ¹⁵⁷
Apr. 10.0	19.134 ⁸	62.66 ⁴⁷	7.016 ¹¹	31.79 ⁵⁸	21.010 ⁴³	71.29 ²⁹⁸	8.789 ¹³	86.17 ¹⁸²
20.0	19.184 ⁵⁰	63.36 ⁷⁰	7.073 ⁵⁷	31.41 ³⁸	21.021 ¹¹	68.13 ³¹⁶	8.820 ³¹	84.11 ²⁰⁶
30.0	19.279 ⁹⁵	64.28 ⁹²	7.178 ¹⁰⁵	31.29 ¹²	21.090 ⁶⁹	64.85 ³²⁸	8.896 ⁷⁶	81.86 ²²⁵
May 9.9	19.417 ¹³⁸	65.44 ¹¹⁶	7.331 ¹⁵³	31.42 ¹³	21.216 ¹²⁶	61.51 ³³⁴	9.018 ¹²²	79.45 ²⁴¹
19.9	19.598 ¹⁸¹	66.80 ¹³⁶	7.528 ¹⁹⁷	31.81 ³⁹	21.399 ¹⁸³	58.19 ³³²	9.184 ¹⁶⁷	76.93 ²⁵²
29.9	19.817 ²¹⁹	68.34 ¹⁵⁴	7.765 ²³⁷	32.49 ⁶⁸	21.635 ²³⁶	54.97 ³²²	9.391 ²⁰⁷	74.37 ²⁵⁶
June 8.9	20.068 ²⁵¹	70.05 ¹⁷¹	8.036 ²⁷¹	33.42 ⁹³	21.917 ²⁸²	51.93 ³⁰⁴	9.635 ²⁴⁴	71.82 ²⁵⁵
18.8	20.347 ²⁷⁹	71.86 ¹⁸¹	8.333 ²⁹⁷	34.60 ¹¹⁸	22.239 ³²²	49.13 ²⁸⁰	9.908 ²⁷³	69.34 ²⁴⁸
28.8	20.643 ²⁹⁶	73.73 ¹⁸⁷	8.651 ³¹⁸	35.98 ¹³⁸	22.593 ³⁵⁴	46.66 ²⁴⁷	10.203 ²⁹⁵	66.99 ²³⁵
July 8.8	20.951 ³⁰⁸	75.61 ¹⁸⁸	8.978 ³²⁷	37.53 ¹⁵⁵	22.966 ³⁷³	44.58 ²⁰⁸	10.514 ³¹¹	64.86 ²¹³
18.8	21.261 ³¹⁰	77.45 ¹⁸⁴	9.308 ³³⁰	39.22 ¹⁶⁹	23.351 ³⁸⁵	42.94 ¹⁶⁴	10.830 ³¹⁶	62.97 ¹⁸⁹
28.7	21.567 ³⁰⁶	79.21 ¹⁷⁶	9.634 ³²⁶	40.99 ¹⁷⁷	23.738 ³⁸⁷	41.79 ¹¹⁵	11.146 ³¹⁶	61.40 ¹⁵⁷
Aug. 7.7	21.862 ²⁹⁵	80.81 ¹⁶⁰	9.947 ³¹³	42.79 ¹⁸⁰	24.116 ³⁷⁸	41.16 ⁶³	11.452 ³⁰⁶	60.19 ¹²¹
17.7	22.140 ²⁷⁸	82.25 ¹⁴⁴	10.241 ²⁹⁴	44.58 ¹⁷⁹	24.474 ³⁵⁸	41.07 ⁹	11.743 ²⁹¹	59.37 ⁸²
27.6	22.394 ²⁵⁴	83.47 ¹²²	10.512 ²⁷¹	46.32 ¹⁷⁴	24.804 ³³⁰	41.53 ⁴⁶	12.011 ²⁶⁸	58.95 ⁴²
Sept. 6.6	22.623 ²²⁹	84.45 ⁹⁸	10.755 ²⁴³	47.96 ¹⁶⁴	25.098 ²⁹⁴	42.51 ⁹⁸	12.253 ²⁴²	58.94 ¹
16.6	22.822 ¹⁹⁹	85.18 ⁷³	10.968 ²¹³	49.49 ¹⁵³	25.348 ²⁵⁰	43.99 ¹⁴⁸	12.462 ²⁰³	59.35 ⁴¹
26.6	22.990 ¹⁶⁸	85.66 ⁴⁸	11.150 ¹⁸²	50.87 ¹³⁸	25.551 ²⁰³	45.89 ¹⁹⁰	12.638 ¹⁷⁶	60.14 ⁷⁹
Oct. 6.5	23.126 ¹³⁶	85.88 ²²	11.298 ¹⁴⁸	52.08 ¹²¹	25.703 ¹⁵²	48.16 ²²⁷	12.779 ¹⁴¹	61.26 ¹¹²
16.5	23.231 ¹⁰⁵	85.87 ¹	11.414 ⁸⁶	53.13 ¹⁰⁵	25.802 ⁹⁹	50.71 ²⁵⁵	12.883 ¹⁰⁴	62.66 ¹⁴⁰
26.5	23.304 ⁷³	85.85 ²²	11.497 ¹¹³	54.00 ⁸⁷	25.848 ⁴⁶	53.42 ²⁷¹	12.952 ⁶⁹	64.29 ¹⁶³
Nov. 5.5	23.349 ⁴⁵	85.27 ³⁸	11.551 ⁵⁴	54.68 ⁶⁸	25.844 ⁴	56.20 ²⁷⁸	12.987 ³⁵	66.06 ¹⁷⁷
15.4	23.365 ¹⁶	84.74 ⁵³	11.574 ²³	55.19 ⁵¹	25.791 ⁵³	58.93 ²⁷³	12.990 ³	67.89 ¹⁸³
25.4	23.353 ¹²	84.10 ⁶⁴	11.568 ⁶	55.52 ³³	25.693 ⁹⁸	61.50 ²⁵⁷	12.962 ²⁸	69.71 ¹⁸²
Dec. 5.4	23.316 ³⁷	83.39 ⁷¹	11.533 ³⁵	55.67 ¹⁵	25.556 ¹³⁷	63.83 ²³³	12.906 ⁵⁶	71.45 ¹⁷⁴
15.3	23.255 ⁶¹	82.64 ⁷⁵	11.472 ⁶¹	55.65 ²	25.384 ¹⁷²	65.82 ¹⁹⁹	12.824 ⁸²	73.04 ¹⁵⁰
25.3	23.173 ⁸²	81.87 ⁷⁷	11.386 ⁸⁶	55.45 ²⁰	25.182 ²⁰²	67.41 ¹⁵⁹	12.719 ¹⁰⁵	74.42 ¹³⁸
35.3	23.072 ¹⁰¹	81.12 ⁷⁵	11.279 ¹⁰⁷	55.10 ³⁵	24.959 ²²³	68.53 ¹¹²	12.593 ¹²⁶	75.55 ¹¹³
Mean Place	18.526	59.58	6.366	27.71	21.405	75.20	8.444	88.61
Sec δ , Tan δ	1.001	+0.049	1.067	+0.372	1.458	-1.061	1.075	-0.393
D ψ α , D ω α	+0.06	0.00	+0.07	-0.02	+0.05	+0.06	+0.06	+0.02
D ψ δ , D ω δ	+0.4	+0.5	+0.4	+0.5	+0.4	+0.5	+0.3	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Hydri. Mag. 3.0		50 Cassiopeiæ. Mag. 4.1		γ Andromedæ <i>pr.</i> Mag. 2.3		α Arietis. Mag. 2.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 56	° ' " -61 57	h m 1 56	° ' " +72 1	h m 1 58	° ' " +41 56	h m 2 2	° ' " +23 4
	s 11 56	" "	s 11 56	" "	s 11 58	" "	s 2 2	" "
Jan. 0.3	12.34	78.41	27.43	54.86	53.485	30.52	34.538	43.16
10.3	11.95 39	79.10 69	26.91 52	55.77 91	53.323 162	30.63 11	34.423 115	42.83 38
20.3	11.54 41	79.20 10	26.34 57	56.11 34	53.141 182	30.38 25	34.290 133	42.33 50
30.2	11.13 41	78.71 49	25.74 60	55.86 25	52.945 196	29.78 60	34.146 144	41.66 67
Feb. 9.2	10.73 40	77.66 105	25.15 59	55.04 82	52.746 199	28.85 93	33.997 149	40.86 80
	38	157	55	137	193	123	146	90
19.2	10.35	76.09	24.60	53.67	52.553	27.62	33.851	39.96
Mar. 1.1	10.00 35	74.03 206	24.10 50	51.83 184	52.380 173	26.15 147	33.717 134	38.99 97
11.1	9.70 30	71.54 249	23.68 42	49.58 225	52.234 146	24.60 165	33.606 111	38.01 96
21.1	9.46 24	68.69 285	23.36 32	47.03 255	52.128 106	22.75 175	33.524 82	37.06 95
31.1	9.27 19	65.52 317	23.17 19	44.29 274	52.071 57	20.98 177	33.479 45	36.19 87
	11	340	7	283	3	172	2	72
Apr. 10.0	9.16	62.12	23.10	41.46	52.068	19.26	33.477	35.47 55
20.0	9.12 4	58.56 356	23.18 8	38.66 280	52.124 56	17.68 158	33.524 47	34.92 32
30.0	9.17 5	54.92 364	23.39 21	35.99 267	52.239 115	16.29 139	33.619 95	34.60 5
May 10.0	9.30 13	51.29 363	23.73 34	33.56 243	52.413 174	15.17 112	33.762 143	34.52 1
19.9	9.50 20	47.74 355	24.19 46	31.44 212	52.643 230	14.37 80	33.952 190	34.72 20
	28	340	58	174	279	48	231	47
29.9	9.78	44.34	24.77	29.70	52.922	13.89	34.183	35.19
June 8.9	10.12 34	41.19 315	25.43 66	28.39 131	53.244 322	13.78 11	34.450 267	35.94 75
18.8	10.53 41	38.35 284	26.16 73	27.55 84	53.599 355	14.04 26	34.747 297	36.93 99
28.8	10.98 45	35.91 244	26.95 79	27.21 34	53.978 379	14.66 62	35.064 317	38.15 122
July 8.8	11.46 51	33.92 199	27.77 82	27.37 16	54.371 393	15.61 95	35.394 330	39.56 141
		148	84	65	398	127	336	157
18.8	11.97	32.44 91	28.61	28.02	54.769	16.88	35.730	41.13 168
28.7	12.49 52	31.53 35	29.44 83	29.15 113	55.162 393	18.44 156	36.062 332	42.82 174
Aug. 7.7	13.00 51	31.18 25	30.24 80	30.73 158	55.543 381	20.22 178	36.384 322	44.56 170
17.7	13.49 43	31.43 83	31.01 77	32.72 199	55.903 360	22.19 197	36.688 304	46.32 171
27.7	13.95 46	32.26 83	31.73 72	35.07 235	56.238 335	24.33 214	36.972 284	48.06 167
	40	140	65	269	303	223	256	
Sept. 6.6	14.35	33.66	32.38	37.76	56.541	26.56	37.228	49.73 158
16.6	14.70 35	35.57 191	32.95 57	40.71 295	56.810 269	28.84 228	37.456 228	51.31 146
26.6	14.98 28	37.92 235	33.43 48	43.85 314	57.042 232	31.13 229	37.653 197	52.77 132
Oct. 6.5	15.17 19	40.63 271	33.82 39	47.13 328	57.234 192	33.40 227	37.817 164	54.09 116
16.5	15.29 12	43.59 296	34.12 30	50.49 336	57.387 153	35.60 220	37.950 133	55.25 100
	5	311	20	337	113	208	99	
26.5	15.34	46.70	34.32	53.86	57.500	37.68	38.049	56.25
Nov. 5.5	15.30 4	49.84 314	34.40 8	57.16 330	57.572 72	39.63 195	38.117 68	57.09 34
15.4	15.19 11	52.87 303	34.38 2	60.31 315	57.605 33	41.39 176	38.154 37	57.74 46
25.4	14.99 20	55.70 283	34.26 12	63.22 291	57.598 7	42.92 153	38.160 6	58.22 48
Dec. 5.4	14.74 25	58.20 250	34.03 23	65.82 260	57.554 44	44.19 127	38.136 24	58.52 30
	30	209	32	222	83	99	52	12
15.4	14.44	60.29	33.71	68.04	57.471	45.18	38.084	58.64
25.3	14.09 35	61.89 160	33.28 43	69.80 176	57.353 118	45.85 67	38.003 81	58.59 5
35.3	13.71 38	62.94 105	32.79 49	71.05 125	57.205 148	46.16 31	37.899 104	58.35 24
Mean Place	10.726	66.83	24.092	31.04	51.536	12.82	32.805	31.10
Sec δ , Tan δ	2.128	-1.878	3.241	+3.083	1.344	+0.899	1.087	+0.426
$D\psi\alpha$, $D\omega\alpha$	+0.04	+0.11	+0.10	-0.18	+0.07	-0.05	+0.07	-0.02
$D\psi\delta$, $D\omega\delta$	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington at Time.	β Trianguli. Mag. 3.1		55 Cassiopeiæ. Mag. 6.2		6 Persei. Mag. 5.4		ξ^1 Ceti. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 4	° ' " +34 36	h m 2 8	° ' " +66 8	h m 2 8	° ' " +50 41	h m 2 8	° ' " + 8 27
	s	"	s	"	s	"	s	"
1. 0.3	41.408	15.55	4.61	49.70	10.771	27.54	40.746	52.22
10.3	41.273 135	15.52 3	4.25 36	50.59 89	10.573 198	27.97 43	40.643 103	51.59 63
20.3	41.118 155	15.19 33	3.84 41	50.94 35	10.348 225	27.98 1	40.522 121	50.94 65
30.2	40.947 171	14.58 61	3.41 43	50.74 20	10.107 241	27.56 42	40.390 132	50.31 63
b. 9.2	40.772 175	13.72 86	2.98 43	50.00 74	9.858 249	26.72 84	40.252 138	49.70 61
	170	109	42	125	241	123	136	56
19.2	40.602	12.63	2.56	48.75	9.617	25.49	40.116	49.14
ur. 1.1	40.447 155	11.37 126	2.18 38	47.05 170	9.396 221	23.94 155	39.992 124	48.66 48
11.1	40.316 131	9.99 138	1.85 33	44.97 208	9.208 188	22.13 181	39.884 108	48.29 37
21.1	40.218 98	8.55 144	1.60 25	42.61 236	9.067 141	20.14 199	39.803 81	48.06 23
31.1	40.163 55	7.12 143	1.44 16	40.04 257	8.980 87	18.05 209	39.754 49	47.98 8
	7	135	6	264	23	209	10	10
ir. 10.0	40.156	5.77	1.38	37.40	8.957	15.96	39.744	48.08
20.0	40.204 48	4.58 119	1.42 4	34.79 261	9.002 45	13.94 202	39.778 34	48.41 33
30.0	40.305 101	3.58 100	1.57 15	32.29 250	9.117 115	12.09 185	39.857 79	48.96 55
iy 10.0	40.460 155	2.84 74	1.82 25	30.00 229	9.301 184	10.48 161	39.982 125	49.74 78
19.9	40.667 207	2.39 45	2.16 34	28.01 199	9.549 248	9.17 131	40.150 168	50.72 98
	253	14	45	162	307	97	208	122
29.9	40.920	2.25	2.61	26.39	9.856	8.20	40.358	51.94
ne 8.9	41.212 292	2.44 19	3.12 51	25.17 122	10.214 358	7.61 59	40.600 242	53.34 140
18.8	41.536 324	2.94 50	3.69 57	24.39 78	10.612 308	7.42 19	40.872 272	54.88 154
28.8	41.884 348	3.77 83	4.31 62	24.08 31	11.039 427	7.63 21	41.165 293	56.54 166
ly 8.8	42.245 361	4.87 110	4.96 65	24.25 17	11.486 447	8.25 62	41.472 307	58.26 172
	367	135	65	62	455	97	312	174
18.8	42.612	6.22	5.61	24.87	11.941	9.22	41.784	60.00
28.7	42.976 364	7.80 158	6.27 66	25.94 107	12.392 451	10.55 133	42.096 312	61.70 170
ig. 7.7	43.329 353	9.54 174	6.92 65	27.44 150	12.832 440	12.20 165	42.399 303	63.33 163
17.7	43.665 336	11.41 187	7.53 61	29.31 187	13.252 420	14.11 191	42.687 288	64.84 151
27.7	43.976 311	13.37 196	8.11 58	31.53 222	13.643 391	16.25 214	42.954 267	66.20 136
	284	200	53	251	358	231	244	115
pt. 6.6	44.260	15.37	8.64	34.04	14.001	18.56	43.198	67.35
16.6	44.512 252	17.38 201	9.12 48	36.79 275	14.321 320	21.01 245	43.415 217	68.31 96
26.6	44.731 219	19.34 196	9.52 40	39.73 294	14.601 280	23.55 254	43.603 188	69.04 73
t. 6.5	44.916 185	21.24 190	9.86 34	42.81 308	14.835 234	26.12 257	43.760 157	69.55 51
16.5	45.064 148	23.04 180	10.13 27	45.95 314	15.023 188	28.67 255	43.886 126	69.84 29
	113	167	20	314	142	250	97	10
26.5	45.177	24.71	10.33	49.09	15.165	31.17	43.983	69.94
v. 5.5	45.253 76	26.23 152	10.44 11	52.15 306	15.259 94	33.55 238	44.049 66	69.86 8
15.4	45.295 42	27.58 135	10.48 4	55.09 294	15.303 44	35.78 223	44.087 38	69.62 24
25.4	45.300 5	28.71 113	10.42 6	57.83 274	15.299 4	37.77 199	44.095 8	69.27 35
c. 5.4	45.271 29	29.63 92	10.29 13	60.27 244	15.248 51	39.51 174	44.075 20	68.81 46
	63	67	20	209	98	144	45	54
15.4	45.208	30.30	10.09	62.36	15.150	40.95	44.030	68.27
25.3	45.114 94	30.70 40	9.81 28	64.03 167	15.009 141	42.02 107	43.958 72	67.68 59
35.3	44.990 124	30.82 12	9.48 33	65.22 119	14.828 181	42.69 67	43.865 93	67.05 63
Place	39.528	0.09	1.623	27.27	8.531	8.09	39.087	45.04
, Tan δ	1.215	+0.690	2.473	+2.262	1.579	+1.221	1.011	+0.149
, $D_{\omega} \alpha$	+0.07	-0.04	+0.09	-0.13	+0.08	-0.07	+0.06	-0.01
, $D_{\omega} \delta$	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Fornacis. Mag. 5.2			γ Trianguli. Mag. 4.1			67 Ceti. Mag. 5.7			ϕ Eridani. Mag. 3.8		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 2 9	s 2 9	° ' 5	h m 2 12	s 2 12	° ' 28	h m 2 12	s 2 12	° ' 47	h m 2 13	s 2 13	° ' 52
Jan. 0.3	19.093		95.21	27.973		21.81	55.133		56.22	36.336		98.95
10.3	18.937	156	96.28	27.843	130	21.79	55.026	107	57.13	36.069	267	99.99
20.3	18.766	171	96.95	27.693	150	21.50	54.900	126	57.87	35.783	286	100.50
30.2	18.586	180	97.22	27.526	167	20.95	54.764	136	58.44	35.488	295	100.45
Feb. 9.2	18.402	184	97.08	27.353	173	20.14	54.622	142	58.82	35.193	295	99.87
		178			171			140			285	
19.2	18.224		96.53	27.182		19.13	54.482		58.99	34.908		98.78
Mar. 1.2	18.059	165	95.60	27.024	158	17.94	54.351	131	58.95	34.643	265	97.20
11.1	17.913	146	94.29	26.888	136	16.64	54.238	113	58.68	34.407	236	95.17
21.1	17.797	116	92.64	26.786	102	15.28	54.149	89	58.18	34.210	197	92.75
31.1	17.716	81	90.65	26.723	63	13.92	54.092	57	57.44	34.060	150	90.00
		40			14			20			95	
Apr. 10.0	17.676		88.40	26.709		12.64	54.072		56.46	33.965		86.95
20.0	17.682	6	85.90	26.745	36	11.51	54.095	23	55.24	33.927	38	83.70
30.0	17.737	55	83.22	26.836	91	10.55	54.162	67	53.81	33.953	26	80.31
May 10.0	17.841	104	80.41	26.981	145	9.85	54.273	111	52.17	34.045	92	76.84
19.9	17.993	152	77.52	27.177	196	9.42	54.428	155	50.36	34.198	153	73.40
		198			244			195			214	
29.9	18.191		74.62	27.421		9.29	54.623		48.42	34.412		70.03
June 8.9	18.428	237	71.78	27.703	282	9.48	54.853	230	46.38	34.682	270	66.82
18.9	18.700	272	69.07	28.019	316	9.97	55.114	261	44.30	35.000	318	63.87
28.8	19.000	300	66.57	28.359	340	10.76	55.396	282	42.23	35.358	358	61.24
July 8.8	19.318	318	64.33	28.716	357	11.84	55.694	298	40.23	35.745	387	58.98
		329			362			307			408	
18.8	19.647		62.41	29.078		13.14	56.001		38.35	36.153		57.20
28.7	19.978	331	60.88	29.439	361	14.65	56.306	305	36.65	36.568	415	55.91
Aug. 7.7	20.304	326	59.78	29.790	351	16.33	56.604	298	35.17	36.981	413	55.17
17.7	20.614	310	59.14	30.126	336	18.13	56.890	286	33.96	37.378	397	54.99
27.7	20.905	291	58.97	30.438	312	20.00	57.156	266	33.04	37.752	374	55.39
		263			287			243			339	
Sept. 6.6	21.168		59.28	30.725		21.92	57.399		32.44	38.091		56.36
16.6	21.399	231	60.05	30.982	257	23.83	57.614	215	32.17	38.388	297	57.85
26.6	21.594	195	61.25	31.206	224	25.71	57.801	187	32.21	38.637	249	59.82
Oct. 6.6	21.752	158	62.83	31.397	191	27.52	57.956	155	32.55	38.830	193	62.18
16.5	21.870	118	64.71	31.552	155	29.23	58.080	124	33.17	38.964	134	64.87
		79			121			94			79	
26.5	21.949		66.83	31.673		30.80	58.174	62	34.00	39.043	20	67.75
Nov. 5.5	21.990	41	69.08	31.758	85	32.24	58.236	144	35.01	39.063	38	70.74
15.4	21.993	3	71.38	31.808	50	33.52	58.268	128	36.15	39.025	38	73.71
25.4	21.960	33	73.65	31.822	14	34.59	58.272	107	37.35	38.933	92	76.56
Dec. 5.4	21.894	66	75.77	31.802	20	35.47	58.247	88	38.57	38.792	141	79.15
		95			53			63			186	
15.4	21.799		77.69	31.749		36.10	58.196		39.75	38.606		81.41
25.3	21.676	123	79.32	31.662	87	36.50	58.119	77	40.86	38.383	223	83.25
35.3	21.531	145	80.64	31.545	117	36.63	58.020	99	41.86	38.128	255	84.63
Mean Place	17.545		90.12	26.049		6.97	53.524		58.37	34.696		89.17
Sec δ , Tan δ	1.168		-0.603	1.199		+0.661	1.007		-0.119	1.620		-1.275
$D\phi\alpha$, $D\omega\alpha$	+0.05		+0.03	+0.07		-0.04	+0.06		+0.01	+0.04		+0.07
$D\phi\delta$, $D\omega\delta$	+0.3		+0.5	+0.3		+0.5	+0.3		+0.5	+0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington on Time.	♄ Ceti. (Mira.) Var. 1.7-9.6		♋ Fornacis. Mag. 5.4		♊ Hydri. Mag. 4.3		♑ Cassiopeiæ. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 15	° ' " - 3 20	h m 2 18	° ' " -24 10	h m 2 20	° ' " -69 1	h m 2 22	° ' " +67 2
an. 0.3	13.812	54.19	48.989	82.07	19.08	68.10	20.74	26.64
10.3	13.708 ¹⁰⁴	55.05 ⁸⁶	48.856 ¹³³	83.19 ¹¹²	18.53 ⁵⁵	69.01 ⁹¹	20.37 ³⁷	27.71 ¹⁰⁷
20.3	13.586 ¹²²	55.78 ⁷³	48.706 ¹⁵⁰	83.98 ⁷⁹	17.96 ⁵⁷	69.34 ³³	19.95 ⁴²	28.25 ⁵⁴
30.2	13.452 ¹³⁴	56.38 ⁶⁰	48.543 ¹⁶³	84.42 ⁴⁴	17.37 ⁵⁹	69.06 ²⁸	19.51 ⁴⁴	28.23 ²
Feb. 9.2	13.312 ¹⁴⁰	56.82 ⁴⁰	48.375 ¹⁶⁸	84.50 ⁸	16.78 ⁵⁰	68.19 ⁸⁷	19.05 ⁴⁶	27.68 ⁵⁵
19.2	13.173 ¹³⁰	57.09 ⁹	48.210 ¹⁵⁶	84.22 ⁶³	16.22 ⁵²	66.76 ¹⁹⁴	18.60 ⁴⁰	26.61 ¹⁸⁴
Mar. 1.2	13.043 ¹¹³	57.18 ¹²	48.054 ¹³⁸	83.59 ⁹⁷	15.70 ⁴⁸	64.82 ²⁴⁰	18.20 ³⁶	25.07 ¹⁹⁵
11.1	12.930 ⁹⁰	57.06 ³³	47.916 ¹¹³	82.62 ¹³¹	15.22 ⁴⁰	62.42 ²⁷⁰	17.84 ²⁹	23.12 ²²⁷
21.1	12.840 ⁵⁷	56.73 ⁵⁴	47.803 ⁷⁹	81.31 ¹⁶¹	14.82 ³³	59.63 ³¹³	17.55 ²¹	20.85 ²⁴⁹
31.1	12.783 ²⁰	56.19 ⁷⁹	47.724 ⁴⁰	79.70 ¹⁸⁷	14.49 ²⁴	56.50 ³³⁸	17.34 ¹⁰	18.36 ²⁶³
pr. 10.0	12.763 ²²	55.40 ¹⁰⁰	47.684 ³	77.83 ²¹⁴	14.25 ¹⁴	53.12 ³⁵⁷	17.24 ¹	15.73 ²⁶⁴
20.0	12.785 ⁶⁶	53.17 ¹²³	47.687 ⁴⁹	75.69 ²³⁴	14.11 ⁴	49.55 ³⁶⁷	17.25 ¹³	13.09 ²⁵⁴
30.0	12.851 ¹¹¹	51.74 ¹⁴³	47.736 ⁹⁷	73.35 ²⁵⁰	14.07 ⁶	45.88 ³⁶⁰	17.38 ²²	10.55 ²³⁸
May 10.0	12.962 ¹⁵⁴	50.11 ¹⁶³	47.833 ¹⁴³	70.85 ²⁶²	14.13 ¹⁷	42.19 ³⁶⁴	17.60 ³³	8.17 ²¹¹
19.9	13.116 ¹⁹⁵	48.34 ¹⁷⁷	47.976 ¹⁸⁶	68.23 ²⁶⁷	14.30 ²⁶	38.55 ³⁴⁸	17.93 ⁴²	6.06 ¹⁷⁸
29.9	13.311 ²²⁹	46.46 ¹⁸⁸	48.162 ²²⁶	65.56 ²⁶⁵	14.56 ³⁷	35.07 ³²⁷	18.35 ⁵⁰	4.28 ¹⁴¹
June 8.9	13.540 ²⁶⁰	44.51 ¹⁹⁵	48.388 ²⁶⁰	62.91 ²⁵⁸	14.93 ⁴⁴	31.80 ²⁹⁶	18.85 ⁵⁸	2.87 ⁹⁷
18.9	13.800 ²⁸²	42.54 ¹⁹⁴	48.648 ²⁸⁵	60.33 ²⁴⁴	15.37 ⁵¹	28.84 ²⁵⁸	19.43 ⁶³	1.90 ⁵²
28.8	14.082 ²⁹⁷	40.60 ¹⁸⁶	48.933 ³⁰⁵	57.89 ²²⁴	15.88 ⁵⁸	26.26 ²¹³	20.06 ⁶⁶	1.38 ⁶
July 8.8	14.379 ³⁰⁶	38.75 ¹⁷⁰	49.238 ³¹⁶	55.65 ¹⁹⁷	16.46 ⁶¹	24.13 ¹⁶²	20.72 ⁶⁸	1.32 ⁴¹
18.8	14.685 ³⁰⁵	37.05 ¹⁵¹	49.554 ³¹⁹	53.68 ¹⁶⁴	17.07 ⁶⁴	22.51 ¹⁰⁷	21.40 ⁶⁸	1.73 ⁸⁶
28.7	14.990 ²⁹⁹	35.54 ¹²⁹	49.873 ³¹⁴	52.04 ¹²⁶	17.71 ⁶⁴	21.44 ⁴⁸	22.08 ⁶⁷	2.59 ¹²⁹
Aug. 7.7	15.289 ²⁸⁶	34.25 ¹⁰²	50.187 ³⁰⁰	50.78 ⁸⁶	18.35 ⁶³	20.96 ¹³	22.75 ⁶⁶	3.88 ¹⁶⁸
17.7	15.575 ²⁶⁶	33.23 ⁷²	50.487 ²⁸³	49.92 ⁴²	18.98 ⁵⁹	21.09 ⁷³	23.41 ⁶²	5.56 ²⁰⁴
27.7	15.841 ²⁴⁵	32.51 ⁴³	50.770 ²⁵⁸	49.50 ¹	19.57 ⁵⁵	21.82 ¹³²	24.03 ⁵⁷	7.60 ²³⁵
Sept. 6.6	16.086 ²¹⁷	31.96 ¹²	51.028 ²³¹	49.51 ⁴⁵	20.12 ⁴⁷	23.14 ¹⁸⁶	24.60 ⁵¹	9.95 ²⁶²
16.6	16.303 ¹⁸⁹	32.13 ¹⁷	51.259 ¹⁹⁷	49.96 ⁸⁷	20.59 ³⁹	25.00 ²³⁵	25.11 ⁴⁵	12.57 ²⁸²
26.6	16.492 ¹⁵⁷	32.54 ⁴¹	50.83 ¹⁶³	50.83 ¹²⁴	20.98 ³⁰	27.35 ²⁷⁴	25.56 ³⁹	15.39 ²⁹⁹
Oct. 6.6	16.649 ¹²⁷	33.18 ⁸²	51.619 ¹²⁸	52.07 ¹⁵⁵	21.28 ²⁰	30.09 ³⁰⁵	25.95 ³²	18.38 ³⁰⁹
16.5	16.776 ⁹⁸	34.00 ⁹⁵	51.747 ⁹²	53.62 ¹⁸⁰	21.48 ¹⁰	33.14 ³²²	26.27 ²³	21.47 ³¹¹
26.5	16.874 ⁶⁶	34.95 ¹⁰³	51.839 ⁵⁷	55.42 ¹⁹⁵	21.58 ²	36.36 ³²⁹	26.50 ¹⁶	24.58 ³⁰⁷
Nov. 5.5	16.940 ³⁶	35.98 ¹⁰⁷	51.896 ²²	57.37 ²⁰⁵	21.56 ¹³	39.65 ³²²	26.66 ⁶	27.65 ²⁹⁸
15.4	16.976 ²¹	37.05 ¹⁰⁶	51.918 ¹²	59.42 ²⁰⁴	21.43 ²³	42.87 ³⁰³	26.72 ¹	30.63 ²⁸⁰
25.4	16.984 ⁴⁶	38.11 ¹⁰¹	51.906 ⁴²	61.46 ¹⁹⁶	21.20 ³¹	45.90 ²⁷³	26.71 ¹⁰	33.43 ²⁵⁴
Dec. 5.4	16.963 ⁷³	39.12 ⁹³	51.864 ⁷²	63.42 ¹⁸¹	20.89 ⁴¹	48.63 ²³²	26.61 ¹⁹	35.97 ²²²
15.4	16.917 ⁹⁵	40.05 ¹²⁴	51.792 ⁹⁹	65.23 ¹⁵⁸	20.48 ⁴⁷	50.95 ¹⁸⁵	26.42 ²⁶	38.19 ¹⁸²
25.3	16.844 ⁹⁵	47.391	51.693 ¹²⁴	66.81 ¹³⁴	20.01 ⁵²	52.80 ¹³⁰	26.16 ³³	40.01 ¹³⁷
35.3	16.749	47.391	51.569	68.15	19.49	54.10	25.83	41.38
Place	12.179	57.40	47.391	78.89	17.076	56.06	17.416	4.82
h, Tan δ	1.002	-0.058	1.096	-0.449	2.794	-2.609	2.563	+2.360
D _a	+0.06	0.00	+0.05	+0.02	+0.02	+0.14	+0.10	-0.13
D _δ	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ^2 Ceti. Mag. 4.3		σ Ceti. Mag. 4.8		36 H. Cassiopeiae. Mag. 5.3		γ Ceti. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 23	° ' " + 8 5	h m 2 28	° ' " -15 35	h m 2 30	° ' " +72 27	h m 2 31	° ' " + 5 14
Jan. 0.3	49.547	42.12	13.617	74.32	16.46	60.69	35.878	15.77
10.3	49.449 ⁹⁸	41.49 ⁶³	13.502 ¹¹⁵	75.40 ¹⁰⁸	15.97 ⁴⁹	62.01 ¹³²	35.783 ⁹⁵	15.08 ⁶⁰
20.3	49.330 ¹¹⁹	40.86 ⁶³	13.369 ¹³³	76.25 ⁸⁶	15.41 ⁵⁶	62.79 ⁷⁸	35.666 ¹¹⁷	14.41 ⁶⁷
30.2	49.197 ¹³³	40.24 ⁶²	13.222 ¹⁴⁷	76.82 ⁵⁷	14.81 ⁶⁰	62.99 ²⁰	35.534 ¹³²	13.79 ⁶³
Feb. 9.2	49.056 ¹⁴¹	39.65 ⁵⁹	13.067 ¹⁵⁵	77.10 ²⁸	14.20 ⁶¹	62.61 ³⁸	35.393 ¹⁴¹	13.23 ⁵⁶
19.2	48.914 ¹⁴²	39.12 ⁵⁸	12.912 ¹⁵⁵	77.11 ¹	13.59 ⁶¹	61.66 ⁹⁵	35.249 ¹⁴⁴	12.76 ⁴⁷
Mar. 1.2	48.780 ¹³⁴	38.66 ⁴⁶	12.764 ¹⁴⁸	76.81 ³⁰	13.03 ⁵⁶	60.19 ¹⁴⁷	35.111 ¹³⁸	12.39 ³⁷
11.1	48.662 ¹¹⁸	38.30 ³⁶	12.631 ¹³³	76.22 ⁵⁹	12.52 ⁵¹	58.28 ¹⁹¹	34.989 ¹²²	12.16 ²³
21.1	48.568 ⁹⁴	38.09 ²¹	12.522 ¹⁰⁹	75.36 ⁸⁶	12.11 ⁴¹	55.99 ²²⁹	34.889 ¹⁰⁰	12.07 ⁹
31.1	48.507 ⁶¹	38.03 ⁶	12.444 ⁷⁸	74.20 ¹¹⁶	11.82 ²⁹	53.42 ²⁵⁷	34.820 ⁶⁹	12.15 ⁸
Apr. 10.1	48.483 ²⁴	38.14 ¹¹	12.403 ⁴¹	72.79 ¹⁴¹	11.66 ¹⁶	50.70 ²⁷²	34.788 ³²	12.43 ²⁸
20.0	48.502 ¹⁹	38.47 ³³	12.403 ⁰	71.12 ¹⁶⁷	11.62 ⁴	47.91 ²⁷⁹	34.798 ¹⁰	12.48 ⁴⁵
30.0	48.567 ⁶⁵	39.00 ⁵³	12.448 ⁴⁵	69.23 ¹⁸⁹	11.73 ¹¹	45.16 ²⁷⁵	34.853 ⁵⁵	13.61 ⁷⁰
May 10.0	48.677 ¹¹⁰	39.77 ⁷⁷	12.539 ⁹¹	67.17 ²⁰⁶	11.99 ²⁶	42.57 ²⁵⁰	34.953 ¹⁰⁰	14.51 ⁹⁰
19.9	48.831 ¹⁵⁴	40.74 ⁹⁷	12.675 ¹³⁶	64.95 ²²²	12.37 ³⁸	40.20 ²³⁷	35.098 ¹⁴⁵	15.63 ¹¹²
29.9	49.027 ¹⁹⁶	41.93 ¹¹⁹	12.853 ¹⁷⁸	62.63 ²³²	12.88 ⁵¹	38.16 ²⁰⁴	35.283 ¹⁸⁵	16.93 ¹³⁰
June 8.9	49.259 ²³²	43.29 ¹³⁶	13.070 ²¹⁷	60.26 ²³⁷	13.49 ⁶¹	36.49 ¹⁶⁷	35.507 ²²⁴	18.40 ¹⁴⁷
18.9	49.522 ²⁶³	44.79 ¹⁸⁰	13.319 ²⁴⁹	57.91 ²³⁵	14.19 ⁷⁰	35.24 ¹²⁵	35.761 ²⁵⁴	19.99 ¹³⁸
28.8	49.807 ²⁸³	46.41 ¹⁶²	13.593 ²⁷⁴	55.62 ²²⁹	14.96 ⁷⁷	34.44 ⁸⁰	36.040 ²⁷⁹	21.67 ¹⁶⁸
July 8.8	50.110 ³⁰³	48.09 ¹⁷⁰	13.886 ²⁹³	53.48 ²¹⁴	15.78 ⁸²	34.12 ³²	36.336 ²⁹⁶	23.39 ¹⁷⁷
18.8	50.420 ³¹¹	49.79 ¹⁶⁵	14.191 ³⁰⁸	51.52 ¹⁷¹	16.63 ⁸⁷	34.28 ⁶⁴	36.643 ³⁰⁶	25.11 ¹⁶
28.8	50.731 ³⁰⁴	51.44 ¹⁵⁹	14.499 ³⁰³	49.81 ¹⁴¹	17.50 ⁸⁶	34.92 ¹⁰⁹	36.951 ³⁰³	26.76 ¹⁵
Aug. 7.7	51.035 ²⁹³	53.03 ¹⁴⁶	14.802 ²⁹³	48.40 ¹⁰⁶	18.36 ⁸³	36.01 ¹⁵²	37.254 ²⁹³	28.32 ¹⁴
17.7	51.328 ²⁷⁵	54.49 ¹⁸⁰	15.095 ²⁷⁷	47.34 ⁷⁰	19.19 ⁷⁹	37.53 ¹⁹¹	37.547 ²⁷⁷	29.73 ¹²
27.7	51.603 ²⁵³	55.79 ¹¹¹	15.372 ²⁵⁵	46.64 ³¹	19.98 ⁷³	39.44 ²²⁷	37.824 ²⁵⁵	30.94 ¹⁰
Sept. 6.6	51.856 ²²⁸	56.90 ⁹⁰	15.627 ²²⁹	46.33 ⁸	20.71 ⁶⁸	41.71 ²⁵⁹	38.079 ²³²	31.95 ⁷
16.6	52.084 ²⁰⁰	57.80 ⁶⁷	15.856 ²⁰⁰	46.41 ⁴⁵	21.39 ⁶⁰	44.30 ²⁸³	38.311 ²⁰⁴	32.71 ⁵
26.6	52.284 ¹⁷¹	58.47 ⁴⁶	16.056 ¹⁶⁸	46.86 ⁸¹	21.99 ⁵¹	47.13 ³⁰⁴	38.516 ¹⁷⁶	33.24 ²
Oct. 6.6	52.455 ¹⁴³	58.93 ²³	16.224 ¹³⁸	47.67 ¹¹¹	22.50 ⁴²	50.17 ³¹⁸	38.691 ¹⁴⁸	33.52 ¹
16.5	52.598 ¹¹¹	59.16 ⁴	16.362 ¹⁰⁴	48.78 ¹³⁵	22.92 ³²	53.35 ³²⁵	38.839 ¹¹⁷	33.58 ¹
26.5	52.709 ⁸¹	59.20 ¹³	16.466 ⁷¹	50.13 ¹⁵⁴	23.24 ²¹	56.60 ³²⁶	38.956 ⁸⁹	33.42 ³
Nov. 5.5	52.790 ⁵³	59.07 ²⁹	16.537 ⁴¹	51.67 ¹⁶⁶	23.45 ¹⁰	59.86 ³¹⁸	39.045 ⁵⁸	33.09 ⁴
15.5	52.843 ²³	58.78 ⁴⁰	16.578 ⁸	53.33 ¹⁷⁰	23.55 ²	63.04 ³⁰³	39.103 ²⁸	32.62 ⁵
25.4	52.866 ⁶	58.38 ⁵⁰	16.586 ²³	55.03 ¹⁶⁶	23.53 ¹³	66.07 ²⁸⁰	39.131 ¹	32.03 ⁶
Dec. 5.4	52.860 ³⁵	57.88 ⁵⁷	16.563 ⁵¹	56.69 ¹⁵⁸	23.40 ²⁵	68.87 ²⁴⁸	39.130 ³⁰	31.37 ⁷
15.4	52.825 ⁶³	57.31 ⁶¹	16.512 ⁷⁹	58.27 ¹⁴⁴	23.15 ³⁵	71.35 ²⁰⁹	39.100 ⁵⁸	30.65 ⁷
25.3	52.762 ⁸⁷	56.70 ⁶⁴	16.433 ¹⁰³	59.71 ¹²⁴	22.80 ⁴⁴	73.44 ¹⁶²	39.042 ⁸⁴	29.91 ⁷
35.3	52.675	56.06	16.330	60.95	22.36	75.06	38.958	29.18
Mean Place	47.804	35.41	11.958	73.56	12.271	38.61	34.112	10.16
Sec δ , Tan δ	1.010	+0.142	1.038	-0.279	3.319	+3.165	1.004	+0.092
$D\phi\alpha$, $D\omega\alpha$	+0.06	-0.01	+0.06	+0.01	+0.11	-0.17	+0.06	-0.01
$D\phi\delta$, $D\omega\delta$	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington on Time.	μ Hydr. Mag. 5.3		γ Arietis. Mag. 5.4		δ Ceti. Mag. 4.0		ϵ Hydr. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 33	° ' " -79 27	h m 2 34	° ' " +21 36	h m 2 35	° ' " - 0 1	h m 2 38	° ' " -68 36
n. 0.3	25.46	74.86	11.331	37.53	18.436	24.22	21.56	76.93
10.3	24.28 ¹¹⁸	75.78 ⁹²	11.231 ¹⁰⁰	37.26 ²⁷	18.340 ⁹⁶	25.06 ⁸⁴	21.03 ⁵³	78.12 ¹¹⁹
20.3	23.05 ¹²³	76.10 ³²	11.106 ¹²⁵	36.87 ³⁹	18.222 ¹¹⁸	25.80 ⁷⁴	20.47 ⁵⁶	78.72 ⁶⁰
30.2	21.79 ¹²⁶	75.82 ²⁸	10.964 ¹⁴²	36.34 ⁵³	18.089 ¹³³	26.43 ⁶³	19.88 ⁵⁹	78.72 ⁰
b. 9.2	20.54 ¹²⁵	74.95 ⁸⁷	10.811 ¹⁵³	35.70 ⁶⁴	17.946 ¹⁴³	26.94 ⁵¹	19.30 ⁵⁸	78.13 ⁵⁰
19.2	19.33 ¹²¹	73.51 ¹⁴⁴	10.655 ¹⁵⁶	34.96 ⁷⁴	17.800 ¹⁴⁶	27.31 ⁸⁷	18.72 ⁵⁸	76.97 ¹¹⁶
ar. 1.2	18.19 ¹¹⁴	71.55 ¹⁹⁶	10.505 ¹⁵⁰	34.17 ⁷⁹	17.660 ¹⁴⁰	27.52 ²¹	18.18 ⁵⁴	75.28 ¹⁶⁰
11.1	17.15 ¹⁰⁴	69.15 ²⁴⁰	10.372 ¹³³	33.35 ⁸²	17.534 ¹²⁶	27.56 ⁴	17.68 ⁶⁰	73.11 ²¹⁷
21.1	16.24 ⁹¹	66.35 ²⁸⁰	10.265 ¹⁰⁷	32.54 ⁸¹	17.430 ¹⁰⁴	27.41 ¹⁵	17.24 ⁴⁴	70.52 ²⁵⁹
31.1	15.47 ⁷⁷	63.22 ³¹³	10.191 ⁷⁴	31.81 ⁷³	17.357 ⁷³	27.07 ³⁴	16.88 ³⁶	67.56 ²⁹⁶
or. 10.1	14.87 ⁶⁰	59.84 ³³⁸	10.158 ³³	31.18 ⁶³	17.320 ⁸⁷	26.51 ⁵⁶	16.59 ²⁹	64.32 ³²⁴
20.0	14.45 ⁴²	56.27 ³⁵⁷	10.170 ¹²	30.69 ⁴⁹	17.325 ⁵	25.73 ⁷⁸	16.41 ¹⁸	60.85 ³⁴⁷
30.0	14.22 ²³	52.61 ³⁶⁶	10.231 ⁶¹	30.40 ²⁹	17.373 ⁴⁸	24.73 ¹⁰⁰	16.32 ⁹	57.24 ³⁶¹
ay 10.0	14.18 ⁴	48.94 ³⁶⁷	10.342 ¹¹¹	30.33 ⁷	17.467 ⁹⁴	23.52 ¹²¹	16.33 ¹	53.57 ³⁶⁷
19.9	14.34 ¹⁶	45.33 ³⁸¹	10.500 ¹⁵⁸	30.49 ¹⁶	17.604 ¹⁶	22.12 ¹⁴⁰	16.45 ¹²	49.92 ³⁶⁵
29.9	14.69 ³⁵	41.87 ³⁴⁶	10.702 ²⁰²	30.89 ⁴⁰	17.784 ¹⁸⁰	20.54 ¹⁵⁸	16.67 ²²	46.40 ³⁵²
ne 8.9	15.24 ⁵⁵	38.63 ³²⁴	10.943 ²⁴¹	31.55 ⁶⁶	18.001 ²¹⁷	18.84 ¹⁷⁰	16.98 ³¹	43.03 ³³⁷
18.9	15.94 ⁷⁰	35.71 ²⁹²	11.217 ²⁷⁴	32.41 ⁸⁶	18.250 ²⁴⁹	17.04 ¹⁸⁰	17.38 ⁴⁰	39.95 ³⁰⁶
28.8	16.79 ⁸⁵	33.17 ²⁵⁴	11.518 ³⁰¹	33.48 ¹⁰⁷	18.524 ²⁷⁴	15.19 ¹⁸⁵	17.86 ⁴⁸	37.22 ²⁷³
ly 8.8	17.76 ⁹⁷	31.07 ²¹⁰	11.836 ³¹⁸	34.74 ¹²⁶	18.815 ²⁹¹	13.35 ¹⁸⁴	18.39 ⁵³	34.91 ²³¹
18.8	18.84 ¹⁰⁸	29.48 ¹⁵⁹	12.163 ³²⁷	36.13 ¹³⁹	19.118 ³⁰³	11.55 ¹⁸⁰	18.98 ⁵⁹	33.08 ¹⁸³
28.8	19.98 ¹¹⁴	28.45 ¹⁰³	12.493 ³³⁰	37.62 ¹⁴⁹	19.423 ³⁰⁵	9.88 ¹⁶⁷	19.60 ⁶²	31.80 ¹²⁸
ug. 7.7	21.15 ¹¹⁷	28.02 ⁴³	12.818 ³²⁵	39.16 ¹⁵⁴	19.724 ³⁰¹	8.35 ¹⁵³	20.23 ⁶³	31.10 ⁷⁰
17.7	22.31 ¹¹⁶	28.19 ¹⁷	13.132 ³¹⁴	40.72 ¹⁵⁶	20.015 ²⁹¹	7.02 ¹³³	20.85 ⁶²	31.00 ¹⁰
27.7	23.42 ¹¹¹	28.96 ⁷⁷	13.428 ²⁹⁶	42.25 ¹⁵³	20.291 ²⁷⁶	5.93 ¹⁰⁹	21.45 ⁶⁰	31.53 ⁵³
pt. 6.6	24.46 ¹⁰⁴	30.33 ¹³⁷	13.704 ²⁷⁶	43.71 ¹⁴⁶	20.546 ²⁵⁵	5.09 ⁸⁴	22.01 ⁵⁶	32.65 ¹¹²
16.6	25.38 ⁹²	32.23 ¹⁹⁰	13.953 ²⁴⁹	45.09 ¹³⁸	20.778 ²³²	4.55 ⁵⁴	22.51 ⁵⁰	34.34 ¹⁶⁹
26.6	26.15 ⁷⁷	34.62 ²³⁹	14.176 ²²³	46.34 ¹²⁵	20.983 ²⁰⁵	4.27 ²⁸	22.94 ⁴³	36.54 ²²⁰
t. 6.6	26.74 ⁵⁹	37.40 ²⁷⁸	14.371 ¹⁹⁵	47.45 ¹¹¹	21.161 ¹⁷⁸	4.27 ⁰	23.28 ³⁴	39.18 ²⁶⁴
16.5	27.13 ³⁹	40.50 ³¹⁰	14.535 ¹⁶⁴	48.43 ⁹⁸	21.308 ¹⁴⁷	4.52 ²⁵	23.51 ²³	42.16 ²⁹⁶
26.5	27.30 ¹⁷	43.77 ³²⁷	14.669 ¹³⁴	49.26 ⁸³	21.427 ¹¹⁹	4.99 ⁴⁷	23.65 ¹⁴	45.36 ³²⁰
iv. 5.5	27.25 ⁵	47.10 ³³³	14.770 ¹⁰¹	49.93 ⁶⁷	21.516 ⁸⁹	5.66 ⁶⁷	23.68 ³	48.68 ³³²
15.5	26.98 ²⁷	50.36 ³²⁶	14.840 ⁷⁰	50.46 ⁵³	21.574 ⁵⁸	6.46 ⁸⁰	23.61 ⁷	51.98 ³³⁰
25.4	26.50 ⁴⁸	53.43 ³⁰⁷	14.878 ³⁸	50.84 ³⁸	21.602 ²⁸	7.35 ⁵⁹	23.43 ¹⁸	55.13 ³¹⁵
c. 5.4	25.81 ⁶⁹	56.21 ²⁷⁸	14.884 ⁶	51.07 ²⁸	21.602 ⁰	8.30 ⁹⁵	23.15 ²⁸	58.03 ²⁹⁰
15.4	24.96 ⁸⁵	58.56 ²³⁵	14.857 ²⁷	51.17 ¹⁰	21.571 ³¹	9.26 ⁹⁶	22.79 ³⁶	60.56 ²⁵³
25.3	23.96 ¹⁰⁰	60.42 ¹⁸⁶	14.799 ⁵⁸	51.13 ⁴	21.513 ⁵⁸	10.20 ⁹⁴	22.36 ⁴³	62.63 ²⁰⁷
35.3	22.84 ¹¹²	61.73 ¹³¹	14.712 ⁸⁷	50.94 ¹⁹	21.429 ⁸⁴	11.09 ⁸⁹	21.86 ⁵⁰	64.18 ¹⁵⁵
Place	22.374	62.43	9.410	26.95	16.690	28.13	19.377	65.29
Tan δ	5.469	-5.377	1.076	+0.306	1.000	0.000	2.743	-2.558
D_{α}	-0.03	+0.28	+0.07	-0.02	+0.06	0.00	+0.02	+0.13
D_{δ}	+0.3	+0.6	+0.3	+0.6	+0.3	+0.3	+0.3	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Persei. Mag. 4.2		γ Ceti seq. Mag. 3.7		π Ceti. Mag. 4.4		μ Ceti. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 38	° ' " +48 52	h m 2 39	° ' " + 2 53	h m 2 40	° ' " -14 11	h m 2 40	° ' " + 9 46
Jan. 0.3	37.937	74.67 65	4.773	31.93	14.846	79.63	32.240	14.18
10.3	37.770 ¹⁶⁷	75.32 ²⁵	4.680 ⁹³	31.16 ⁷⁷	14.738 ¹⁰⁸	80.75 ¹¹²	32.149 ⁹¹	13.59 ⁵⁹
20.3	37.568 ²⁰²	75.57 ¹⁴	4.564 ¹¹⁶	30.46 ⁷⁰	14.609 ¹²⁹	81.65 ⁹⁰	32.034 ¹¹⁵	12.99 ⁶⁰
30.3	37.342 ²²⁶	75.43 ⁵⁴	4.432 ¹³²	29.82 ⁶⁴	14.463 ¹⁴⁶	82.29 ⁶⁴	31.902 ¹³²	12.39 ⁶⁰
Feb. 9.2	37.101 ²⁴¹	74.89 ⁹¹	4.289 ¹⁴³	29.28 ⁵⁴	14.307 ¹⁵⁶	82.65 ³⁶	31.758 ¹⁴⁴	11.81 ⁵⁸
19.2	36.858 ²³²	73.98 ¹²⁵	4.142 ¹⁴¹	28.85 ²⁹	14.149 ¹⁵³	82.74 ²⁰	31.611 ¹⁴³	11.27 ⁴⁸
Mar. 1.2	36.626 ²⁰⁷	72.73 ¹⁵⁴	4.001 ¹²⁸	28.56 ¹⁶	13.996 ¹⁴⁰	82.54 ⁴⁷	31.468 ¹²⁸	10.79 ⁴¹
11.1	36.419 ¹⁶⁸	71.19 ¹⁷⁴	3.873 ¹⁰⁶	28.40 ¹	13.856 ¹¹⁷	82.07 ⁷⁷	31.340 ¹⁰⁷	10.38 ²⁸
21.1	36.251 ¹²⁰	69.45 ¹⁸⁸	3.767 ⁷⁶	28.41 ²⁰	13.739 ⁸⁸	81.30 ¹⁰⁵	31.233 ⁷⁵	10.10 ¹⁵
31.1	36.131 ⁶²	67.57 ¹⁹⁴	3.691 ³⁹	28.61 ³⁸	13.651 ⁵¹	80.25 ¹³⁰	31.158 ³⁸	9.95 ¹
Apr. 10.1	36.069 ³	65.63 ¹⁹¹	3.652 ⁰	28.99 ⁶¹	13.600 ¹⁰	78.95 ¹⁵⁶	31.120 ⁴	9.96 ²¹
20.0	36.072 ⁷⁰	63.72 ¹⁸¹	3.652 ⁴⁶	29.60 ⁸¹	13.590 ⁸⁴	77.39 ¹⁷⁸	31.124 ⁵⁰	10.17 ⁴⁰
30.0	36.142 ¹³⁹	61.91 ¹⁶²	3.698 ⁹²	30.41 ¹⁰²	13.624 ³⁰	75.61 ¹⁹⁷	31.174 ⁹⁶	10.57 ⁶²
May 10.0	36.281 ²⁰³	60.29 ¹³⁸	3.790 ¹³⁶	31.43 ¹²³	13.704 ¹²⁶	73.64 ²¹⁴	31.270 ¹⁴¹	11.19 ⁸³
20.0	36.484 ²⁶³	58.91 ¹⁰⁰	3.926 ¹⁷⁸	32.66 ¹⁴⁰	13.830 ¹⁶⁸	71.50 ²²⁵	31.411 ¹⁸⁴	12.02 ¹⁰³
29.9	36.747 ³¹⁷	57.82 ⁷⁶	4.104 ²¹⁶	34.06 ¹⁵⁵	13.998 ²⁰⁷	69.25 ²³¹	31.595 ²²⁰	13.05 ¹²²
June 8.9	37.064 ³⁶²	57.06 ⁴⁰	4.320 ²⁴⁹	35.61 ¹⁶⁷	14.205 ²⁴⁰	66.94 ²³²	31.815 ²⁵⁵	14.27 ¹³⁷
18.9	37.426 ³⁹⁷	56.66 ⁵	4.569 ²⁷³	37.28 ¹⁷⁴	14.445 ²⁶⁸	64.62 ²²⁶	32.070 ²⁷⁹	15.64 ¹⁴⁹
28.8	37.823 ⁴²¹	56.61 ³²	4.842 ²⁹¹	39.02 ¹⁷⁶	14.713 ²⁸⁷	62.36 ²¹⁴	32.349 ²⁹⁷	17.13 ¹⁵⁷
July 8.8	38.244 ⁴³⁷	56.93 ⁶⁷	5.133 ³⁰⁴	40.78 ¹⁷³	15.000 ³⁰¹	60.22 ¹⁹⁷	32.646 ³¹⁰	18.70 ¹⁶⁰
18.8	38.681 ⁴⁴¹	57.60 ⁹⁹	5.437 ³⁰⁶	42.51 ¹⁶⁵	15.301 ³⁰⁶	58.25 ¹⁷⁴	32.956 ³¹²	20.30 ¹⁵⁹
28.8	39.122 ⁴³⁷	58.59 ¹³⁰	5.743 ³⁰²	44.16 ¹⁵³	15.607 ³⁰³	56.51 ¹⁴⁵	33.268 ³⁰⁹	21.89 ¹⁵³
Aug. 7.7	39.559 ⁴²⁴	59.89 ¹⁵⁷	6.045 ²⁹³	45.69 ¹³⁶	15.910 ²⁹⁵	55.06 ¹¹²	33.577 ²⁹⁸	23.42 ¹⁴³
17.7	39.983 ⁴⁰³	61.46 ¹⁷⁹	6.338 ²⁷⁸	47.05 ¹¹⁴	16.205 ²⁸⁰	53.94 ⁷⁷	33.875 ²⁸⁴	24.85 ¹²⁹
27.7	40.386 ³⁷⁸	63.25 ¹⁹⁸	6.616 ²⁵⁷	48.19 ⁹¹	16.485 ²⁶⁰	53.17 ³⁸	34.159 ²⁶³	26.14 ¹¹¹
Sept. 6.7	40.764 ³⁴⁵	65.23 ²¹³	6.873 ²³⁶	49.10 ⁶⁶	16.745 ²³⁷	52.79 ⁰	34.422 ²⁴²	27.25 ⁹²
16.6	41.109 ³¹¹	67.36 ²²³	7.109 ²⁰⁸	49.76 ⁴⁰	16.982 ²⁰⁸	52.79 ³⁸	34.664 ²¹⁵	28.17 ⁷⁰
26.6	41.420 ²⁷¹	69.59 ²³⁰	7.317 ¹⁸²	50.16 ¹³	17.190 ¹⁸¹	53.17 ⁷²	34.879 ¹⁸⁸	28.87 ⁵⁰
Oct. 6.6	41.691 ²³⁰	71.89 ²³¹	7.499 ¹⁵²	50.29 ⁹	17.371 ¹⁴⁸	53.89 ¹⁰³	35.067 ¹⁵⁹	29.37 ²⁸
16.5	41.921 ¹⁸⁷	74.20 ²³⁰	7.651 ¹²³	50.20 ³²	17.519 ¹¹⁷	54.92 ¹³⁰	35.226 ¹³¹	29.65 ¹⁰
26.5	42.108 ¹⁴¹	76.50 ²²²	7.774 ⁹⁴	49.88 ⁴⁹	17.636 ⁸⁶	56.22 ¹⁴⁸	35.357 ¹⁰¹	29.75 ⁶
Nov. 5.5	42.249 ⁹⁴	78.72 ²¹¹	7.868 ⁶³	49.39 ⁶⁴	17.722 ⁵³	57.70 ¹⁶²	35.458 ⁷⁰	29.69 ²⁰
15.5	42.343 ⁴⁵	80.83 ¹⁹⁶	7.931 ³³	48.75 ⁷⁵	17.775 ²¹	59.32 ¹⁶⁷	35.528 ⁴⁰	29.49 ³⁴
25.4	42.388 ⁴	82.79 ¹⁷⁶	7.964 ⁵	48.00 ⁸¹	17.796 ¹⁰	60.99 ¹⁶⁵	35.568 ⁹	29.15 ⁴³
Dec. 5.4	42.384 ⁵³	84.55 ¹⁶⁰	7.969 ²⁶	47.19 ⁸⁴	17.786 ⁴⁰	62.64 ¹⁵⁸	35.577 ²¹	28.72 ⁵⁰
15.4	42.331 ¹⁰²	86.05 ¹¹⁹	7.943 ⁵⁴	46.35 ⁸⁴	17.746 ⁷⁰	64.22 ¹⁴⁶	35.556 ⁵⁰	28.22 ⁵⁶
25.4	42.229 ¹⁴⁶	87.24 ⁸⁶	7.889 ⁸²	45.51 ⁸²	17.676 ⁹⁵	65.68 ¹²⁶	35.506 ⁷⁹	27.66 ⁵⁹
35.3	42.083	88.10	7.807	44.69	17.581	66.94	35.427	27.07
Mean Place	35.445	57.11	2.983	27.22	13.123	79.18	30.393	7.39
Sec δ , Tan δ	1.521	+1.146	1.001	+0.061	1.031	-0.253	1.015	+0.172
$D\psi\alpha$, $D\psi\alpha$	+0.08	-0.06	+0.06	0.00	+0.06	+0.01	+0.06	-0.01
$D\psi\delta$, $D\psi\delta$	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	7 Persei. Mag. 3.9		41 Arietis. Mag. 3.7		β Fornacis. Mag. 4.5		σ Arietis. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 44	° ' " +55 33	h m 2 45	° ' " +26 55	h m 2 45	° ' " -32 44	h m 2 46	° ' " +14 44
Jan. 0.3	45.132	40.74	11.215	35.78	41.268	64.78	59.660	49.31
10.3	44.929 ²⁰³	41.68 ⁹⁴	11.115 ¹⁰⁰	35.73 ⁵	41.117 ¹⁵¹	66.19 ¹⁴¹	59.571 ⁸⁹	48.87 ⁴⁴
20.3	44.685 ²⁴⁴	42.17 ⁴⁹	10.986 ¹²⁹	35.48 ²⁵	40.944 ¹⁷³	67.18 ⁹⁸	59.456 ¹¹⁵	48.37 ⁵⁰
30.3	44.410 ²⁷⁵	42.21 ⁴	10.837 ¹⁴⁹	35.07 ⁴¹	40.755 ¹⁸⁹	67.76 ⁵⁸	59.322 ¹³⁴	47.82 ⁵⁵
Feb. 9.2	44.118 ²⁹²	41.81 ⁴⁰	10.674 ¹⁶³	34.48 ⁵⁹	40.555 ²⁰⁰	67.91 ¹⁵	59.175 ¹⁴⁷	47.24 ⁵⁸
19.2	43.823 ²⁹⁵	40.96 ⁸⁵	10.506 ¹⁶⁸	33.73 ⁷⁵	40.353 ²⁰²	67.62 ²⁹	59.023 ¹⁵²	46.65 ⁵⁹
Mar. 1.2	43.538 ²⁸⁵	39.71 ¹²⁵	10.345 ¹⁶¹	32.87 ⁸⁶	40.158 ¹⁹⁵	66.91 ⁷¹	58.875 ¹⁴⁸	46.06 ⁵⁹
11.1	43.284 ²⁵⁴	38.12 ¹⁵⁹	10.198 ¹⁴⁷	31.92 ⁹⁵	39.978 ¹⁸⁰	65.80 ¹¹¹	58.740 ¹³⁵	45.50 ⁵⁶
21.1	43.072 ²¹²	36.26 ¹⁸⁶	10.077 ¹²¹	30.94 ⁹⁸	39.823 ¹⁵⁵	64.30 ¹⁵⁰	58.628 ¹¹²	45.01 ⁴⁹
31.1	42.917 ¹⁵⁵	34.19 ²⁰⁷	9.990 ⁸⁷	29.97 ⁹⁷	39.700 ¹²³	62.46 ¹⁸⁴	58.546 ⁸²	44.62 ³⁹
Apr. 10.1	42.828 ⁸⁹	32.02 ²¹⁷	9.944 ⁴⁶	29.07 ⁹⁰	39.617 ⁸³	60.30 ²¹⁶	58.501 ⁴⁵	44.37 ²⁵
20.0	42.812 ¹⁶	29.84 ²¹⁸	9.946 ²	28.28 ⁷⁹	39.579 ³⁸	57.87 ²⁴³	58.500 ¹	44.27 ¹⁰
30.0	42.875 ⁶³	27.73 ²¹¹	9.998 ⁵²	27.67 ⁶¹	39.589 ¹⁰	55.23 ²⁶⁴	58.544 ⁴⁴	44.36 ⁹
May 10.0	43.015 ¹⁴⁰	25.76 ¹⁹⁷	10.102 ¹⁰⁴	27.24 ⁴³	39.650 ⁶¹	52.39 ²⁸⁴	58.636 ⁹²	44.67 ³¹
20.0	43.231 ²¹⁶	24.03 ¹⁷³	10.255 ¹⁵³	27.05 ¹⁹	39.761 ¹¹¹	49.46 ²⁹³	58.775 ¹³⁹	45.19 ⁵²
29.9	43.518 ²⁸⁷	22.57 ¹⁴⁶	10.456 ²⁰¹	27.10 ⁵	39.920 ¹⁵⁹	46.48 ²⁹⁸	58.958 ¹⁸³	45.92 ⁷³
June 8.9	43.866 ³⁴⁸	21.45 ¹¹²	10.698 ²⁴²	27.42 ³²	40.125 ²⁰⁵	43.53 ²⁹⁵	59.180 ²²²	46.85 ⁹³
18.9	44.267 ⁴⁰¹	20.70 ⁷⁵	10.975 ²⁷⁷	27.97 ⁵⁵	40.369 ²⁴⁴	40.68 ²⁸⁵	59.435 ²⁵⁵	47.98 ¹¹³
28.8	44.710 ⁴⁴³	20.33 ³⁷	11.281 ³⁰⁶	28.76 ⁷⁹	40.645 ²⁷⁶	38.01 ²⁶⁷	59.716 ²⁸¹	49.25 ¹²⁷
July 8.8	45.184 ⁴⁷⁴	20.35 ²	11.606 ³²⁵	29.76 ¹⁰⁰	40.947 ³⁰²	35.58 ²⁴³	60.018 ³⁰²	50.64 ¹³⁹
18.8	45.676 ⁴⁹²	20.77 ⁴²	11.943 ³³⁷	30.95 ¹¹⁹	41.267 ³²⁰	33.46 ²¹²	60.330 ³¹²	52.10 ¹⁴⁶
28.8	46.177 ⁵⁰¹	21.56 ⁷⁹	12.285 ³⁴²	32.28 ¹³³	41.596 ³²⁹	31.72 ¹⁷⁴	60.647 ³¹⁷	53.60 ¹⁵⁰
Aug. 7.7	46.674 ⁴⁹⁷	22.70 ¹¹⁴	12.623 ³³⁸	33.71 ¹⁴³	41.926 ³³⁰	30.41 ¹³¹	60.962 ³¹⁵	55.10 ¹⁵⁰
17.7	47.158 ⁴⁸⁴	24.16 ¹⁴⁶	12.952 ³²⁹	35.22 ¹⁵¹	42.249 ³²³	29.56 ⁸⁵	61.267 ³⁰⁵	56.54 ¹⁴⁴
27.7	47.622 ⁴⁶⁴	25.91 ¹⁷⁵	13.264 ³¹²	36.75 ¹⁵³	42.557 ³⁰⁸	29.21 ³⁵	61.559 ²⁹²	57.89 ¹³⁵
Sept. 6.7	48.057 ⁴³⁵	27.90 ¹⁹⁹	13.557 ²⁹³	38.27 ¹⁵²	42.846 ²⁸⁹	29.37 ¹⁶	61.832 ²⁷³	59.10 ¹²¹
16.6	48.457 ⁴⁰⁰	30.11 ²²¹	13.825 ²⁶⁸	39.75 ¹⁴⁸	43.107 ²⁶¹	30.02 ⁶⁵	62.081 ²⁴⁹	60.18 ¹⁰⁸
26.6	48.818 ³⁶¹	32.46 ²³⁵	14.068 ²⁴³	41.16 ¹⁴¹	43.338 ²³¹	31.15 ¹¹³	62.306 ²²⁵	61.09 ⁹¹
Oct. 6.6	49.135 ³¹⁷	34.93 ²⁴⁷	14.281 ²¹³	42.49 ¹³³	43.534 ¹⁹⁶	32.70 ¹⁵⁵	62.503 ¹⁹⁷	61.81 ⁷²
16.5	49.406 ²⁷¹	37.48 ²⁵⁵	14.464 ¹⁸³	43.70 ¹²¹	43.692 ¹⁵⁸	34.61 ¹⁹¹	62.672 ¹⁶⁹	62.36 ⁵⁵
26.5	49.625 ²¹⁹	40.04 ²⁵⁶	14.615 ¹⁵¹	44.79 ¹⁰⁹	43.812 ¹²⁰	36.81 ²²⁰	62.813 ¹⁴¹	62.74 ³⁸
Nov. 5.5	49.791 ¹⁶⁶	42.57 ²⁵³	14.734 ¹¹⁹	45.76 ⁹⁷	43.894 ⁸²	39.20 ²³⁹	62.922 ¹⁰⁹	62.95 ²¹
15.5	49.901 ¹¹⁰	45.02 ²⁴⁵	14.820 ⁸⁶	46.60 ⁸⁴	43.935 ⁴¹	41.70 ²⁵⁰	63.002 ⁸⁰	63.03 ⁸
25.4	49.953 ⁵²	47.33 ²³¹	14.872 ⁵²	47.28 ⁶⁸	43.938 ³	44.20 ²⁵⁰	63.051 ⁴⁹	62.97 ⁶
Dec. 5.4	49.946 ⁷	49.42 ²⁰⁹	14.889 ¹⁷	47.83 ⁵⁵	43.903 ³⁵	46.61 ²⁴¹	63.068 ¹⁷	62.81 ¹⁶
15.4	49.880 ⁶⁶	51.27 ¹⁸⁵	14.870 ¹⁹	48.22 ³⁹	43.831 ⁷²	48.83 ²²²	63.052 ¹⁶	62.55 ²⁶
25.4	49.757 ¹²³	52.80 ¹⁵³	14.818 ⁵²	48.43 ²¹	43.725 ¹⁰⁶	50.79 ¹⁹⁶	63.007 ⁴⁵	62.21 ³⁴
35.3	49.579 ¹⁷⁸	53.96 ¹¹⁶	14.732 ⁸⁶	48.47 ⁴	43.590 ¹³⁵	52.42 ¹⁶³	62.930 ⁷⁷	61.80 ⁴¹
Mean Place	42.304	22.18	9.157	24.11	39.529	59.37	57.736	41.23
Sec δ , Tan δ	1.768	+1.458	1.122	+0.508	1.189	-0.643	1.034	+0.263
$D\psi\alpha$, $D_m\alpha$	+0.09	-0.07	+0.07	-0.03	+0.05	+0.03	+0.07	-0.01
$D\psi\delta$, $D_m\delta$	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^2 Eridani. Mag. 4.8		τ Persel. Mag. 4.1		η Eridani. Mag. 4.0		ϵ Arietis (mean). Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 47	° ' " -21 20	h m 2 48	° ' " +52 25	h m 2 52	° ' " - 9 13	h m 2 54	° ' " +21 0
Jan. 0.3	20.797	31.18	28.773	58.05	27.058	24.82	33.196	56.79
10.3	20.678	32.46	28.594	58.90	26.961	25.92	33.107	56.56
20.3	20.537	33.45	28.375	59.36	26.841	26.83	32.989	56.22
30.3	20.378	34.11	28.126	59.38	26.702	27.53	32.850	55.77
Feb. 9.2	20.209	34.43	27.859	58.97	26.550	28.01	32.697	55.22
19.2	20.037	34.42	27.588	58.16	26.394	28.24	32.537	54.58
Mar. 1.2	19.870	34.05	27.327	56.97	26.241	28.24	32.380	53.88
11.2	19.715	33.34	27.090	55.46	26.099	27.99	32.235	53.15
21.1	19.581	32.30	26.893	53.70	25.978	27.49	32.113	52.44
31.1	19.479	30.97	26.749	51.76	25.884	26.73	32.022	51.76
Apr. 10.1	19.413	29.33	26.664	49.72	25.826	25.72	31.970	51.18
20.0	19.388	27.44	26.647	47.87	25.808	24.47	31.962	50.73
30.0	19.409	25.30	26.704	45.69	25.834	23.00	32.001	50.45
May 10.0	19.477	22.99	26.833	43.87	25.906	21.32	32.090	50.35
20.0	19.591	20.52	27.032	42.27	26.022	19.47	32.228	50.48
29.9	19.750	17.98	27.298	40.94	26.182	17.48	32.411	50.83
June 8.9	19.951	15.40	27.622	39.94	26.381	15.39	32.635	51.39
18.9	20.186	12.85	27.996	39.29	26.613	13.26	32.894	52.18
28.9	20.451	10.40	28.409	39.01	26.874	11.16	33.181	53.15
July 8.8	20.738	8.12	28.852	39.10	27.155	9.12	33.490	54.30
18.8	21.042	6.07	29.313	39.54	27.450	7.21	33.811	55.57
28.8	21.352	4.31	29.782	40.35	27.752	5.49	34.138	56.93
Aug. 7.7	21.662	2.88	30.249	41.49	28.054	3.99	34.463	58.35
17.7	21.964	1.85	30.705	42.92	28.349	2.79	34.781	59.77
27.7	22.253	1.23	31.141	44.62	28.631	1.90	35.084	61.17
Sept. 6.7	22.523	1.05	31.552	46.53	28.894	1.35	35.371	62.51
16.6	22.768	1.30	31.931	48.64	29.137	1.16	35.634	63.76
26.6	22.986	1.97	32.274	50.88	29.354	1.32	35.873	64.88
Oct. 6.6	23.175	3.03	32.577	53.22	29.544	1.80	36.085	65.88
16.6	23.330	4.42	32.837	55.62	29.705	2.59	36.269	66.74
26.5	23.452	6.10	33.050	58.03	29.835	3.62	36.423	67.46
Nov. 5.5	23.541	7.97	33.215	60.40	29.936	4.86	36.546	68.04
15.5	23.596	9.96	33.328	62.69	30.006	6.24	36.638	68.49
25.4	23.616	12.00	33.387	64.83	30.044	7.70	36.697	68.81
Dec. 5.4	23.602	14.00	33.392	66.80	30.050	9.18	36.722	69.00
15.4	23.557	15.89	33.341	68.51	30.025	10.61	36.713	69.08
25.4	23.480	17.59	33.237	69.93	29.971	11.96	36.672	69.04
35.3	23.374	19.06	33.082	71.00	29.887	13.16	36.597	68.88
Mean Place	19.053	28.69	26.049	40.31	25.260	25.68	31.161	47.17
Sec δ , Tan δ	1.074	-0.391	1.640	+1.300	1.013	-0.162	1.071	+0.384
$D\alpha$, $D\alpha$	+0.05	+0.02	+0.08	-0.06	+0.06	+0.01	+0.07	-0.02
$D\delta$, $D\delta$	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

APPARENT PLACES OF STARS, 1918.

341

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	47 H. Cephei. Mag. 5.7		θ Eridani. Mag. 3.4		α Ceti. Mag. 2.8		τ^3 Eridani. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 55	° ' " +79 5	h m 2 55	° ' " -40 37	h m 2 57	° ' " + 3 46	h m 2 58	° ' " -23 56
Jan. 0.3	14.40	68.10	11.053	64.94	61.349	12.04	48.384	45.76
10.3	13.63	69.89	10.874	66.49	61.264	11.27	48.265	47.17
20.3	12.74	71.13	10.669	67.59	61.153	10.57	48.121	48.25
30.3	11.76	71.79	10.445	68.20	61.023	9.93	47.957	48.99
Feb. 9.2	10.73	71.83	10.209	68.33	60.879	9.38	47.780	49.36
19.2	9.70	71.27	9.971	67.98	60.727	8.93	47.598	49.37
Mar. 1.2	8.71	70.14	9.738	67.15	60.577	8.60	47.420	49.00
11.2	7.81	68.48	9.522	65.88	60.438	8.42	47.254	48.27
21.1	7.06	66.36	9.330	64.18	60.320	8.37	47.107	47.20
31.1	6.45	63.88	9.174	62.11	60.229	8.51	46.990	45.81
Apr. 10.1	6.04	61.15	9.060	59.71	60.173	8.83	46.909	44.10
20.0	5.84	58.26	8.993	57.02	60.158	9.34	46.869	42.13
30.0	5.85	55.33	8.978	54.10	60.187	10.07	46.874	39.91
May 10.0	6.10	52.46	9.019	51.01	60.261	11.00	46.927	37.51
20.0	6.55	49.75	9.115	47.83	60.381	12.14	47.028	34.95
29.9	7.20	47.30	9.263	44.63	60.544	13.44	47.175	32.31
June 8.9	8.03	45.17	9.461	41.47	60.746	14.89	47.363	29.65
18.9	9.01	43.43	9.704	38.45	60.981	16.47	47.590	27.02
28.9	10.13	42.12	9.985	35.63	61.245	18.13	47.848	24.50
July 8.8	11.34	41.27	10.297	33.10	61.528	19.82	48.131	22.14
18.8	12.63	40.90	10.631	30.92	61.826	21.49	48.432	20.04
28.8	13.96	41.02	10.980	29.15	62.131	23.08	48.742	18.22
Aug. 7.7	15.30	41.63	11.333	27.86	62.434	24.57	49.054	16.77
17.7	16.62	42.70	11.680	27.09	62.731	25.90	49.361	15.73
27.7	17.91	44.22	12.016	26.85	63.016	27.02	49.657	15.12
Sept. 6.7	19.13	46.15	12.330	27.16	63.284	27.93	49.935	14.96
16.6	20.26	48.44	12.618	28.01	63.531	28.58	50.190	15.26
26.6	21.29	51.08	12.872	29.37	63.755	28.98	50.420	16.00
Oct. 6.6	22.20	53.98	13.089	31.19	63.952	29.12	50.619	17.15
16.6	22.97	57.11	13.266	33.40	64.123	29.04	50.785	18.66
26.5	23.57	60.39	13.399	35.92	64.267	28.73	50.920	20.46
Nov. 5.5	24.00	63.75	13.487	38.63	64.380	28.25	51.019	22.48
15.5	24.26	67.11	13.529	41.44	64.463	27.62	51.082	24.64
25.4	24.31	70.40	13.528	44.25	64.517	26.88	51.110	26.84
Dec. 5.4	24.18	73.52	13.482	46.95	64.538	26.07	51.103	29.01
15.4	23.84	76.38	13.393	49.43	64.528	25.24	51.062	31.04
25.4	23.33	78.89	13.266	51.61	64.487	24.41	50.988	32.89
35.3	22.64	80.98	13.104	53.43	64.416	23.60	50.883	34.49
Mean Place	7.470	47.01	9.241	57.84	59.456	7.52	46.590	42.55
Sec δ , Tan δ	5.288	+5.193	1.318	-0.858	1.002	+0.066	1.094	-0.444
$D\phi_a, D\omega_a$	+0.16	-0.25	+0.05	+0.04	+0.06	0.00	+0.05	+0.02
$D\phi_\delta, D\omega_\delta$	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Persei. Mag. 3.1		ρ Persei. Var. 3.4-4.2		μ Horologii. Mag. 5.2		θ Hydri. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 58	° ' +53 11	h m 2 59	° ' +38 31	h m 3 1	° ' -60 2	h m 3 2	° ' -72 12
	s 2 58	" +53 11	s 2 59	" +38 31	s 3 1	" -60 2	s 3 2	" -72 12
Jan. 0.3	53.728	28.23	57.327	37.99	42.68	89.07	7.07	92.96
10.3	53.554 174	29.20 97	57.214 113	38.42 43	42.35 33	90.67 100	6.44 63	94.44 148
20.3	53.337 217	29.77 57	57.067 147	38.57 15	41.97 38	91.73 106	5.75 60	95.33 89
30.3	53.086 251	29.91 14	56.892 175	38.42 15	41.57 40	92.22 49	5.03 72	95.64 31
Feb. 9.2	52.814 280	29.63 28	56.699 193	38.00 42	41.15 42	92.12 10	4.30 73	95.35 29
19.2	52.534 280	28.93 70	56.498 201	37.29 71	40.74 41	91.47 65	3.56 74	94.48 87
Mar. 1.2	52.261 273	27.84 109	56.301 197	36.35 94	40.34 40	90.28 119	2.86 70	93.05 142
11.2	52.012 249	26.42 142	56.119 182	35.19 116	39.96 38	88.58 170	2.21 65	91.13 192
21.1	51.799 213	24.71 171	55.965 154	33.89 130	39.62 34	86.43 215	1.61 60	88.77 236
31.1	51.637 162	22.81 190	55.848 117	32.49 140	39.33 29	83.87 256	1.09 52	86.01 276
Apr. 10.1	51.537 33	20.79 202	55.778 70	31.07 142	39.10 23	80.96 291	0.67 42	82.92 309
20.0	51.504 33	18.73 206	55.760 18	29.68 139	38.94 16	77.78 318	0.35 32	79.58 334
30.0	51.544 40	16.72 201	55.799 39	28.39 129	38.85 9	74.39 330	0.16 19	76.06 352
May 10.0	51.658 114	14.84 188	55.897 98	27.28 111	38.84 1	70.86 353	0.07 9	72.43 363
20.0	51.846 188	13.16 168	56.052 155	26.36 92	38.91 7	67.28 358	0.11 4	68.79 364
29.9	52.100 254	11.72 144	56.280 208	25.70 66	39.05 14	63.74 354	0.27 16	65.22 357
June 8.9	52.416 316	10.61 111	56.516 256	25.30 40	39.27 22	60.30 344	0.56 29	61.80 342
18.9	52.785 369	9.83 78	56.814 298	25.18 12	39.56 20	57.07 323	0.95 39	58.61 319
28.9	53.196 411	9.39 44	57.144 330	25.37 19	39.90 34	54.12 295	1.44 49	55.74 287
July 8.8	53.639 443	9.34 5	57.501 357	25.83 46	40.30 44	51.53 259	2.01 57	53.26 248
18.8	54.103 464	9.65 31	57.873 372	26.57 74	40.74 44	49.38 215	2.65 64	51.24 202
28.8	54.577 474	10.31 66	58.252 379	27.54 97	41.20 46	47.72 166	3.35 70	49.75 149
Aug. 7.7	55.053 476	11.30 99	58.632 380	28.73 119	41.68 48	46.62 110	4.07 72	48.84 91
17.7	55.521 468	12.60 130	59.004 372	30.10 137	42.16 48	46.11 51	4.80 73	48.51 33
27.7	55.971 450	14.17 157	59.361 357	31.60 150	42.63 47	46.21 10	5.52 72	48.81 30
Sept. 6.7	56.398 427	15.97 180	59.700 339	33.23 163	43.08 45	46.91 70	6.20 68	49.74 93
16.6	56.794 396	17.97 200	60.014 314	34.92 169	43.48 40	48.21 130	6.83 63	51.25 151
26.6	57.155 361	20.14 217	60.301 287	36.64 172	43.84 36	50.06 185	7.38 55	53.30 205
Oct. 6.6	57.478 323	22.42 228	60.557 256	38.37 173	44.15 31	52.39 233	7.83 45	55.83 253
16.6	57.759 281	24.77 235	60.781 224	40.09 172	44.38 23	55.13 274	8.17 34	58.74 291
26.5	57.993 284	27.15 238	60.971 190	41.76 167	44.55 17	58.18 305	8.39 22	61.92 318
Nov. 5.5	58.176 183	29.52 237	61.123 152	43.34 158	44.64 9	61.41 323	8.49 10	65.27 335
15.5	58.308 132	31.82 230	61.236 113	44.84 150	44.65 1	64.71 330	8.45 4	68.66 339
25.4	58.385 77	34.01 219	61.310 74	46.22 138	44.59 6	67.95 324	8.27 18	71.95 329
Dec. 5.4	58.406 21	36.02 201	61.341 81	47.43 121	44.46 13	71.01 306	7.99 28	75.02 307
15.4	58.369 37	37.82- 180	61.330 11	48.47 104	44.27 19	73.80 279	7.59 40	77.77 275
25.4	58.275 94	39.33 151	61.277 53	49.29 82	44.01 26	76.19 239	7.08 51	80.10 233
35.3	58.127 148	40.50 117	61.183 94	49.86 57	43.70 31	78.12 193	6.50 58	81.93 183
Mean Place	50.866	10.99	54.953	24.01	40.585	78.86	4.426	81.63
Sec δ , Tan δ	1.669	+1.336	1.278	+0.796	2.003	-1.736	3.275	-3.118
$D_p a, D_m a$	+0.09	-0.06	+0.08	-0.04	+0.03	+0.08	0.00	+0.15
$\delta, D_m \delta$	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Persei. (Algol.) Var. 2.1-3.2		δ Arietis. Mag. 4.5		12 Eridani. Mag. 4.0		48 H. Cephei. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 2	° ' " +40 38	h m 3 6	° ' " +19 25	h m 3 8	° ' " -29 18	h m 3 9	° ' " +77 26
	s	"	s	"	s	"	s	"
Jan. 0.4	52.067	40.74	58.302	11.61	37.045	39.69	58.44	26.78
10.3	51.950	41.27	58.220	11.35	36.916	41.23	57.83	28.67
20.3	51.796	41.50	58.109	11.01	36.760	42.42	57.10	30.03
30.3	51.615	41.43	57.974	10.58	36.584	43.21	56.28	30.84
Feb. 9.2	51.414	41.05	57.822	10.07	36.392	43.59	55.41	31.06
19.2	51.205	40.37	57.662	9.49	36.194	43.57	54.52	30.68
Mar. 1.2	50.999	39.43	57.502	8.86	35.998	43.13	53.65	29.71
11.2	50.808	38.25	57.352	8.22	35.812	42.29	52.84	28.22
21.1	50.645	36.90	57.223	7.59	35.648	41.07	52.14	26.26
31.1	50.521	35.44	57.122	7.01	35.511	39.49	51.57	23.93
Apr. 10.1	50.444	33.94	57.060	6.52	35.412	37.60	51.18	21.30
20.1	50.421	32.46	57.041	6.15	35.354	35.40	50.95	18.50
30.0	50.456	31.06	57.068	5.95	35.343	32.97	50.92	15.63
May 10.0	50.552	29.82	57.144	5.92	35.381	30.33	51.07	12.78
20.0	50.706	28.78	57.268	6.11	35.469	27.56	51.41	10.07
29.9	50.916	27.99	57.439	6.50	35.605	24.70	51.94	7.58
June 8.9	51.175	27.46	57.651	7.10	35.785	21.82	52.62	5.36
18.9	51.477	27.24	57.899	7.90	36.007	19.00	53.45	3.51
28.9	51.815	27.30	58.176	8.87	36.263	16.31	54.41	2.07
July 8.8	52.178	27.67	58.476	10.00	36.546	13.83	55.45	1.07
18.8	52.558	28.31	58.791	11.24	36.850	11.62	56.56	0.54
28.8	52.947	29.21	59.113	12.55	37.165	9.73	57.72	0.47
Aug. 7.8	53.336	30.34	59.435	13.90	37.486	8.24	58.90	0.88
17.7	53.719	31.67	59.752	15.24	37.804	7.20	60.08	1.75
27.7	54.088	33.16	60.057	16.55	38.111	6.62	61.23	3.06
Sept. 6.7	54.436	34.79	60.347	17.78	38.403	6.54	62.34	4.79
16.6	54.761	36.50	60.616	18.90	38.674	6.96	63.38	6.89
26.6	55.058	38.27	60.862	19.90	38.917	7.85	64.34	9.32
Oct. 6.6	55.324	40.07	61.083	20.77	39.130	9.18	65.18	12.04
16.6	55.558	41.86	61.277	21.48	39.312	10.90	65.92	15.01
26.5	55.755	43.63	61.442	22.07	39.457	12.93	66.53	18.14
Nov. 5.5	55.915	45.33	61.579	22.51	39.565	15.19	66.98	21.38
15.5	56.035	46.94	61.683	22.83	39.636	17.59	67.28	24.66
25.5	56.113	48.44	61.754	23.03	39.668	20.04	67.41	27.89
Dec. 5.4	56.147	49.78	61.793	23.12	39.664	22.44	67.37	30.97
15.4	56.137	50.94	61.796	23.12	39.621	24.71	67.16	33.85
25.4	56.083	51.88	61.765	23.01	39.543	26.75	66.79	36.41
35.3	55.986	52.56	61.699	22.82	39.430	28.50	66.25	38.57
Mean Place	43.618	26.42	56.215	2.93	35.202	35.18	51.871	6.92
Sec δ , Tan δ	1.318	+0.858	1.060	+0.353	1.147	-0.561	4.598	+4.488
$D\alpha$, D_{α}	+0.08	-0.04	+0.07	-0.02	+0.05	+0.03	+0.15	-0.20
$D\delta$, D_{δ}	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♈ Arietis. Mag. 5.0		♊ G. Horologii. Mag. 5.7		♋ Eridani. Mag. 4.9		♈ Arietis. Mag. 5.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 10	° ' +20 44	h m 3 10	° ' -57 37	h m 3 11	° ' -9 7	h m 3 16	° ' +20 51
	s	"	s	"	s	"	s	"
Jan. 0.4	13.194	37.60	30.406	51.79	52.828	24.06	31.544	16.72
10.3	13.113 ⁸¹	37.39 ²¹	30.106 ³⁰⁰	53.52 ¹⁷³	52.740 ⁸⁸	25.21 ¹¹⁶	31.466 ⁷⁸	16.55 ¹⁷
20.3	13.002 ¹¹¹	37.10 ²⁹	29.767 ³³⁹	54.72 ¹²⁰	52.625 ¹¹⁵	26.20 ⁹⁹	31.358 ¹⁰⁶	16.26 ²
30.3	12.867 ¹³⁵	36.70 ⁴⁰	29.403 ³⁶⁴	55.36 ⁶⁴	52.488 ¹³⁷	26.96 ⁷⁶	31.225 ¹³³	15.89 ³
Feb. 9.2	12.714 ¹⁵³	36.21 ⁴⁹	29.021 ³⁸²	55.44 ⁸	52.335 ¹⁵³	27.51 ⁵⁵	31.072 ¹⁵³	15.42 ³
	163	58	384	50	160	30	164	5
19.2	12.551	35.63	28.637	54.94	52.175	27.81	30.908	14.87
Mar. 1.2	12.389 ¹⁶²	35.00 ⁶³	28.260 ³⁷⁷	53.92 ¹⁰²	52.013 ¹⁶²	27.88 ⁷	30.744 ¹⁶⁴	14.27 ⁶
11.2	12.236 ¹⁵³	34.33 ⁶⁷	27.906 ³⁵⁴	52.38 ¹⁵⁴	51.861 ¹⁵²	27.69 ¹⁹	30.568 ¹⁵⁶	13.62 ⁶
21.1	12.103 ¹³³	33.67 ⁶⁶	27.584 ³²²	50.38 ²⁰⁰	51.727 ¹³⁴	27.24 ⁴⁵	30.452 ¹³⁶	12.97 ⁶
31.1	12.000 ¹⁰³	33.04 ⁶³	27.307 ²⁷⁷	47.96 ²⁴²	51.618 ¹⁰⁹	26.55 ⁶⁹	30.344 ¹⁰⁶	12.35 ⁶
	66	56	222	277	75	97	72	1
Apr. 10.1	11.934	32.48	27.085	45.19	51.543	25.58	30.272	11.80
20.1	11.910 ²⁴	32.04 ⁴⁴	26.922 ¹⁶³	42.10 ³⁰⁹	51.507 ³⁶	24.39 ¹¹⁹	30.243 ²⁰	11.35 ¹
30.0	11.934 ²⁴	31.76 ²⁸	26.831 ⁹¹	38.81 ³²⁹	51.514 ⁷	22.97 ¹⁴²	30.261 ¹⁸	11.06 ¹
May 10.0	12.007 ⁷³	31.65 ¹¹	26.810 ²¹	35.36 ³⁴⁵	51.565 ⁵¹	21.35 ¹⁶²	30.327 ⁶⁶	10.93 ⁻
20.0	12.129 ¹²²	31.73 ⁸	26.865 ⁵⁵	31.82 ³⁵⁴	51.664 ⁹⁹	19.53 ¹⁸²	30.443 ¹¹⁶	10.99 ⁻
	168	30	127	352	142	194	163	1
29.9	12.297	32.03	26.992	28.30	51.806	17.59	30.606	11.27
June 8.9	12.508 ²¹¹	32.54 ⁵¹	27.191 ¹⁹⁹	24.86 ³⁴⁴	51.987 ¹⁸¹	15.54 ²⁰⁵	30.811 ²⁰⁶	11.74 ¹
18.9	12.755 ²⁴⁷	33.26 ⁷²	27.454 ²⁶³	21.60 ³²⁶	52.204 ²¹⁷	13.44 ²¹⁰	31.054 ²⁴³	12.42 ¹
28.9	13.032 ²⁷⁷	34.15 ⁸⁰	27.775 ³²¹	18.59 ³⁰¹	52.453 ²⁴⁹	11.33 ²¹¹	31.326 ²⁷²	13.27 ¹
July 8.8	13.333 ³⁰⁷	35.20 ¹⁰⁵	28.145 ³⁷⁰	15.92 ²⁶⁷	52.725 ²⁷²	9.29 ²⁰⁴	31.624 ²⁹⁶	14.27 ¹
	315	118	409	225	287	192	314	1
18.8	13.648	36.38	28.554	13.67	53.012	7.37	31.938	15.41
28.8	13.972 ³²⁴	37.64 ¹²⁶	28.989 ⁴³⁵	11.90 ¹⁷⁷	53.310 ²⁹⁸	5.63 ¹⁷⁴	32.261 ³²³	16.64 ¹
Aug. 7.8	14.297 ³²⁵	38.96 ¹³²	29.442 ⁴⁵⁸	10.67 ¹²³	53.611 ³⁰¹	4.12 ¹⁵¹	32.566 ³²⁵	17.91 ¹
17.7	14.617 ³²⁰	40.28 ¹³²	29.897 ⁴⁵⁵	10.02 ⁶⁵	53.905 ²⁹⁴	2.88 ¹²⁴	32.906 ³²⁰	19.19 ¹
27.7	14.925 ³⁰⁶	41.58 ¹³⁰	30.341 ⁴⁴⁴	9.98 ⁴	54.191 ²⁸⁶	1.96 ⁹²	33.216 ³¹⁰	20.45 ¹
	293	124	425	56	271	58	296	1
Sept. 6.7	15.218	42.82	30.766	10.54	54.462	1.38	33.512	21.64
16.6	15.491 ²⁷³	43.95 ¹¹³	31.157 ³⁹¹	11.70 ¹¹⁶	54.715 ²⁵³	1.16 ²²	33.790 ²⁷⁸	22.76 ¹
26.6	15.741 ²⁶⁰	44.98 ¹⁰³	31.506 ³⁴⁹	13.42 ¹⁷²	54.946 ²³¹	1.30 ¹⁴	34.044 ²⁵⁴	23.76 ¹
Oct. 6.6	15.967 ²²⁶	45.89 ⁹¹	31.804 ²⁹⁸	15.64 ²²²	55.151 ²⁰⁵	1.78 ⁴⁸	34.276 ²³²	24.65 ¹
16.6	16.165 ¹⁹⁸	46.67 ⁷⁸	32.042 ²³⁸	18.29 ²⁶⁵	55.330 ¹⁷⁹	2.56 ⁷⁸	34.480 ²⁰⁴	25.39 ¹
	169	63	176	297	149	105	175	1
26.5	16.334	47.30	32.218	21.26	55.479	3.61	34.655	26.02
Nov. 5.5	16.475 ¹⁴¹	47.82 ⁵²	32.325 ¹⁰⁷	24.46 ³²⁰	55.598 ¹¹⁹	4.87 ¹²⁶	34.803 ¹⁴⁸	26.52 ¹
15.5	16.583 ¹⁰⁸	48.21 ³⁹	32.362 ³⁷	27.73 ³²⁷	55.686 ⁸⁸	6.29 ¹⁴²	34.919 ¹¹⁶	26.90 ¹
25.5	16.658 ⁷⁵	48.47 ²⁶	32.331 ³¹	30.98 ³²⁵	55.743 ⁵⁷	7.80 ¹⁵¹	35.001 ⁸²	27.16 ¹
Dec. 5.4	16.700 ⁴²	48.64 ¹⁷	32.231 ¹⁰⁰	34.08 ³¹⁰	55.767 ²⁴	9.33 ¹⁵³	35.049 ⁴⁸	27.32 ¹
	6	6	164	285	8	150	12	1
15.4	16.706	48.70	32.067	36.93	55.759	10.83	35.061	27.39
25.4	16.676 ³⁰	48.66 ⁴	31.846 ²²¹	39.41 ²⁴⁸	55.717 ⁴²	12.24 ¹⁴¹	35.038 ²³	27.36 ⁻
35.3	16.612 ⁶⁴	48.52 ¹⁴	31.573 ²⁷³	41.47 ²⁰⁶	55.645 ⁷²	13.52 ¹²⁸	34.977 ⁶¹	27.24 ⁻
Mean Place	11.074	28.71	28.308	42.09	50.940	24.65	29.388	8.08
Sec δ , Tan δ	1.069	+0.379	1.868	-1.577	1.013	-0.161	1.070	+0.381
$D\alpha$, $D\mu$	+0.07	-0.02	+0.03	+0.07	+0.06	+0.01	+0.07	-0.02
$D\delta$, $D\mu$	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	ϵ Eridani. Mag. 4.3		τ Hydri. Mag. 5.5		α Persei. Mag. 1.9		σ Tauri. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 16	° ' -43 22	h m 3 17	° ' -77 40	h m 3 18	° ' +49 34	h m 3 20	° ' + 8 44
	s	"	s	"	s	"	s	"
n. 0.4	41.092	65.09	62.02	89.74	30.483	28.65	25.930	33.37
10.3	40.919	66.86	61.09	91.36	30.348	29.63	25.857	32.74
20.3	40.713	68.17	60.08	92.42	30.167	30.26	25.756	32.13
30.3	40.484	69.00	59.00	92.88	29.949	30.51	25.629	31.56
40.3	40.238	69.32	57.90	92.75	29.705	30.38	25.484	31.02
50.3	39.984	69.14	56.80	92.05	29.449	29.88	25.329	30.53
60.3	39.732	68.46	55.73	90.78	29.193	29.01	25.171	30.11
70.3	39.494	67.31	54.71	89.00	28.951	27.81	25.020	29.77
80.3	39.279	65.71	53.78	86.78	28.740	26.35	24.887	29.55
90.3	39.095	63.71	52.96	84.13	28.572	24.68	24.780	29.45
100.3	38.953	61.34	52.26	81.17	28.457	22.88	24.706	29.49
110.3	38.860	58.66	51.70	77.94	28.404	21.02	24.672	29.71
120.3	38.819	55.74	51.31	74.51	28.417	19.19	24.683	30.10
130.3	38.833	52.62	51.08	70.95	28.498	17.45	24.739	30.68
140.3	38.904	49.38	51.02	67.33	28.649	15.89	24.841	31.47
150.3	39.032	46.09	51.13	63.79	28.864	14.54	24.988	32.43
160.3	39.214	42.83	51.42	60.37	29.138	13.46	25.175	33.56
170.3	39.445	39.68	51.86	57.18	29.464	12.67	25.399	34.82
180.3	39.720	36.73	52.46	54.25	29.834	12.20	25.663	36.19
190.3	40.030	34.04	53.19	51.71	30.237	12.06	25.930	37.63
200.3	40.367	31.69	54.03	49.62	30.683	12.25	26.224	39.10
210.3	40.724	29.76	54.95	48.03	31.104	12.76	26.528	40.55
220.3	41.090	28.28	55.93	47.02	31.550	13.57	26.834	41.94
230.3	41.458	27.37	56.94	46.60	31.991	14.65	27.136	43.22
240.3	41.817	27.00	57.95	46.76	32.421	15.98	27.430	44.34
250.3	42.161	27.19	58.92	47.57	32.833	17.51	27.711	45.30
260.3	42.479	27.94	59.83	49.00	33.220	19.24	27.973	46.05
270.3	42.768	29.23	60.63	50.93	33.579	21.11	28.216	46.59
280.3	43.023	31.01	61.30	53.39	33.905	23.09	28.435	46.91
290.3	43.235	33.22	61.82	56.24	34.194	25.15	28.630	47.03
300.3	43.404	35.78	62.18	59.39	34.442	27.24	28.797	46.95
310.3	43.526	38.58	62.34	62.73	34.647	29.34	28.938	46.70
320.3	43.601	41.52	62.32	66.14	34.804	31.40	29.047	46.32
330.3	43.627	44.48	62.10	69.48	34.911	33.38	29.124	45.82
340.3	43.605	47.36	61.71	72.63	34.966	35.23	29.170	45.26
350.3	43.536	50.03	61.13	75.48	34.964	36.89	29.182	44.64
360.3	43.423	52.44	60.41	77.94	34.908	38.33	29.159	44.00
370.3	43.271	54.47	59.55	79.90	34.799	39.48	29.103	43.36
1 Place	39.154	57.74	58.486	78.61	27.605	13.41	23.889	28.11
1, Tan δ	1.376	-0.945	4.689	-4.581	1.542	+1.174	1.012	+0.154
D_{α}	+0.04	+0.04	-0.03	+0.20	+0.08	-0.05	+0.06	-0.01
D_{δ}	+0.3	+0.8	+0.3	+0.8	+0.3	+0.8	+0.3	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α H. Camelop. Mag. 4.4		ε Tauri. Mag. 3.8		ζ Tauri. Mag. 4.3		ε Eridani. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	° '	h m	° '	h m	° '	h m	° '
	3 22	+59 39	3 22	+ 9 26	3 26	+12 39	3 29	- 9 45
Jan. 0.4	28.583	37.59	45.435	56.32	22.721	29.65	5.913	65.88
10.3	28.389 194	38.99 140	45.364 71	56.72 80	22.653 68	29.17 48	5.829 84	67.12 12
20.3	28.138 261	39.97 98	45.264 100	55.13 59	22.554 99	28.68 49	5.716 113	68.17 11
30.3	27.840 298	40.51 54	45.138 126	54.56 57	22.427 127	28.17 51	5.579 137	69.00 1
Feb. 9.3	27.510 330	40.58 7	44.994 144	54.03 53	22.282 145	27.67 50	5.424 155	69.58 1
	347	39	155	48	158	49	167	
19.2	27.163	40.19	44.839	53.55	22.124	27.18	5.257	69.92
Mar. 1.2	26.817 346	39.34 85	44.680 159	53.12 43	21.963 161	26.71 47	5.088 169	70.01 -
11.2	26.492 325	38.07 127	44.529 151	52.77 35	21.809 154	26.29 42	4.927 161	69.83
21.1	26.205 287	36.44 163	44.394 135	52.53 24	21.671 138	25.93 36	4.781 146	69.40
31.1	25.972 233	34.54 190	44.286 108	52.40 13	21.559 112	25.67 26	4.660 121	68.70
	165	213	76	1	78	14	90	
Apr. 10.1	25.807	32.41	44.210	52.41	21.481	25.53	4.570	67.76
20.1	25.718 89	30.18 223	44.175 35	52.59 18	21.444 37	25.52 1	4.519 51	66.56 1
30.0	25.714 4	27.92 226	44.182 7	52.94 35	21.450 6	25.69 17	4.511 8	65.13 1
May 10.0	25.797 83	25.71 221	44.237 55	53.47 53	21.502 52	26.03 34	4.548 37	63.50 1
20.0	25.966 169	23.65 206	44.337 100	54.20 73	21.602 100	26.56 53	4.631 83	61.69 1
	250	187	146	91	145	72	127	
30.0	26.216	21.78	44.483	55.11	21.747	27.28	4.758	59.75
June 8.9	26.541 325	20.19 159	44.669 186	56.19 108	21.933 186	28.17 89	4.926 168	57.70 1
18.9	26.932 391	18.91 128	44.892 223	57.41 122	22.157 224	29.21 104	5.131 205	55.60 1
28.9	27.390 448	17.97 94	45.146 254	58.75 134	22.412 255	30.40 119	5.368 237	53.50 1
July 8.8	27.871 491	17.41 56	45.423 277	60.15 140	22.691 279	31.67 127	5.630 262	51.47 1
	523	19	294	145	296	133	280	
18.8	28.394	17.22	45.717	61.60	22.987	33.00	5.910	49.55
28.8	28.938 544	17.42 20	46.023 306	63.02 142	23.294 307	34.35 135	6.202 292	47.81
Aug. 7.8	29.491 553	17.99 57	46.329 306	64.40 138	23.605 311	35.67 132	6.498 296	46.31
17.7	30.041 550	18.90 91	46.632 303	65.67 127	23.912 307	36.92 125	6.794 296	45.09
27.7	30.578 537	20.15 125	46.928 296	66.80 113	24.211 299	38.05 113	7.082 288	44.19
	519	155	282	96	287	101	275	
Sept. 6.7	31.097	21.70	47.210	67.76	24.498	39.06	7.357	43.64
16.7	31.586 489	23.51 181	47.475 265	68.52 76	24.769 271	39.91 85	7.614 257	43.46
26.6	32.040 454	25.56 205	47.719 244	69.09 57	25.019 250	40.57 66	7.852 238	43.64
Oct. 6.6	32.453 413	27.79 223	47.941 222	69.44 35	25.247 228	41.05 48	8.065 213	44.16
16.6	32.819 366	30.17 238	48.138 197	69.57 13	25.450 203	41.34 29	8.254 189	45.01
	314	249	170	4	177	12	160	
26.5	33.133	32.66	48.308	69.53	25.627	41.46	8.414	46.14
Nov. 5.5	33.390 257	35.19 253	48.450 142	69.31 22	25.776 149	41.44 2	8.545 131	47.49
15.5	33.584 194	37.73 264	48.562 112	68.97 34	25.894 118	41.28 16	8.645 100	49.00
25.5	33.712 128	40.22 249	48.643 81	68.51 46	25.982 88	41.01 37	8.712 67	50.60
Dec. 5.4	33.768 56	42.59 237	48.692 49	67.98 53	26.036 54	40.67 24	8.746 34	52.23
	15	218	14	58	19	41	1	
15.4	33.753	44.77	48.706	67.40	26.055	40.26	8.747	53.83
25.4	33.664 89	46.70 193	48.686 20	66.79 61	26.038 17	39.81 45	8.713 34	55.33
35.4	33.507 157	48.31 161	48.633 53	66.18 61	25.987 51	39.34 47	8.645 68	56.70
Mean Place	25.078	20.86	43.377	50.95	20.614	23.57	3.967	65.91
Sec δ, Tan δ	1.980	+1.709	1.014	+0.166	1.025	+0.225	1.015	-0.177
D _α α, D _α α	+0.10	-0.07	+0.06	-0.01	+0.06	-0.01	+0.06	+0.01
D _δ δ, D _δ δ	+0.3	+0.8	+0.3	+0.8	+0.2	+0.8	+0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^3 Eridani. Mag. 4.3		δ Persei. Mag. 3.1		δ Eridani. Mag. 3.7		ν Persei. Mag. 3.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 30	s -21 54	h m 3 37	s +47 31	h m 3 39	s -10 2	h m 3 39	s +42 19
Jan. 0.4	11.783	29.06	7.702	48.89	21.166	25.32	39.804	26.84
10.3	11.686	30.64	7.593	49.91	21.092	26.62	39.713	27.63
20.3	11.557	31.93	7.437	50.61	20.986	27.71	39.578	28.18
30.3	11.402	32.90	7.240	50.97	20.855	28.59	39.405	28.43
Feb. 9.3	11.229	33.51	7.014	51.00	20.703	29.22	39.203	28.38
19.2	11.046	33.77	6.769	50.66	20.537	29.61	38.984	28.02
Mar. 1.2	10.860	33.66	6.519	49.97	20.367	29.73	38.760	27.37
11.2	10.680	33.21	6.279	48.98	20.202	29.59	38.544	26.47
21.2	10.517	32.40	6.064	47.71	20.049	29.20	38.347	25.32
31.1	10.377	31.26	5.885	46.23	19.920	28.53	38.184	24.01
Apr. 10.1	10.271	29.82	5.754	44.59	19.820	27.62	38.065	22.60
20.1	10.203	28.08	5.681	42.88	19.759	26.44	37.998	21.13
30.0	10.179	26.08	5.670	41.17	19.739	25.05	37.988	19.67
May 10.0	10.201	23.87	5.726	39.54	19.763	23.43	38.040	18.29
20.0	10.271	21.48	5.847	38.02	19.833	21.63	38.151	17.06
30.0	10.387	18.98	6.033	36.69	19.949	19.67	38.322	16.00
June 8.9	10.547	16.40	6.277	35.60	20.106	17.61	38.547	15.16
18.9	10.747	13.83	6.573	34.77	20.301	15.49	38.821	14.58
28.9	10.980	11.33	6.914	34.22	20.528	13.38	39.135	14.26
July 8.9	11.243	8.95	7.290	33.97	20.784	11.31	39.483	14.20
18.8	11.527	6.79	7.693	34.02	21.059	9.36	39.855	14.42
28.8	11.824	4.88	8.113	34.37	21.347	7.58	40.243	14.88
Aug. 7.8	12.130	3.30	8.541	34.99	21.643	6.03	40.639	15.59
17.7	12.435	2.11	8.970	35.86	21.939	4.75	41.035	16.50
27.7	12.734	1.33	9.392	36.97	22.230	3.79	41.425	17.60
Sept. 6.7	13.021	0.99	9.800	38.28	22.511	3.19	41.802	18.85
16.7	13.292	1.11	10.188	39.76	22.777	2.96	42.161	20.23
26.6	13.540	1.68	10.552	41.39	23.023	3.09	42.498	21.70
Oct. 6.6	13.765	2.68	10.886	43.12	23.249	3.57	42.809	23.24
16.6	13.960	4.06	11.188	44.94	23.449	4.40	43.091	24.84
26.6	14.125	5.77	11.454	46.81	23.623	5.52	43.339	26.45
Nov. 5.5	14.257	7.72	11.679	48.70	23.769	6.86	43.552	28.07
15.5	14.356	9.86	11.860	50.58	23.883	8.37	43.724	29.65
25.5	14.419	12.07	11.993	52.41	23.965	10.00	43.853	31.17
Dec. 5.4	14.446	14.29	12.075	54.14	24.013	11.66	43.936	32.61
15.4	14.436	16.42	12.103	55.73	24.028	13.29	43.970	33.92
25.4	14.391	18.41	12.076	57.14	24.006	14.83	43.954	35.05
35.4	14.309	20.17	11.995	58.30	23.950	16.24	43.889	36.00
Mean Place	9.850	26.28	4.765	35.34	19.167	25.28	37.045	14.47
Sec δ , Tan δ	1.078	-0.402	1.481	+1.093	1.015	-0.177	1.353	+0.911
$D\psi\alpha$, $D\omega\alpha$	+0.05	+0.02	+0.08	-0.04	+0.06	+0.01	+0.08	-0.04
$D\psi\delta$, $D\omega\delta$	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	5 H. Camelop. Mag. 4.7		η Tauri. (Alyone.) Mag. 3.0		τ ⁶ Eridani. Mag. 4.3		γ Eridani. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 41	° ' " +71 4	h m 3 42	° ' " +23 51	h m 3 43	° ' " -23 29	h m 3 46	° ' " -36 26
Jan. 0.4	46.03	68.51	38.742	17.11	21.162	29.04	25.201	57.56
10.4	45.71	70.48	38.680	17.11	21.068	30.77	25.070	59.56
20.3	45.30	72.01	38.583	17.01	20.940	32.20	24.905	61.18
30.3	44.82	73.05	38.453	16.79	20.785	33.29	24.708	62.36
Feb. 9.3	44.27	73.56	38.300	16.46	20.609	34.01	24.488	63.09
19.2	43.70	73.51	38.130	16.02	20.419	34.37	24.256	63.36
Mar. 1.2	43.12	72.93	37.954	15.49	20.225	34.35	24.019	63.14
11.2	42.56	71.83	37.783	14.88	20.035	33.95	23.787	62.48
21.2	42.05	70.26	37.628	14.23	19.859	33.19	23.572	61.37
31.1	41.63	68.30	37.498	13.56	19.707	32.09	23.382	59.87
Apr. 10.1	41.30	66.03	37.402	12.91	19.586	30.67	23.226	57.99
20.1	41.08	63.52	37.348	12.33	19.503	28.93	23.111	55.77
30.1	40.99	60.89	37.341	11.85	19.464	26.93	23.044	53.26
May 10.0	41.03	58.24	37.384	11.50	19.471	24.71	23.027	50.52
20.0	41.20	55.66	37.476	11.33	19.525	22.30	23.063	47.60
30.0	41.50	53.22	37.617	11.32	19.626	19.75	23.151	44.56
June 8.9	41.90	51.01	37.803	11.52	19.773	17.14	23.290	41.50
18.9	42.42	49.09	38.030	11.89	19.960	14.53	23.475	38.48
28.9	43.04	47.51	38.291	12.45	20.184	11.98	23.702	35.57
July 8.9	43.73	46.31	38.579	13.18	20.438	9.56	23.966	32.85
18.8	44.47	45.52	38.888	14.03	20.714	7.35	24.257	30.42
28.8	45.26	45.15	39.210	15.00	21.009	5.39	24.570	28.34
Aug. 7.8	46.08	45.21	39.538	16.04	21.313	3.78	24.896	26.67
17.8	46.91	45.68	39.866	17.12	21.619	2.55	25.228	25.45
27.7	47.73	46.56	40.188	18.21	21.920	1.75	25.558	24.75
Sept. 6.7	48.53	47.83	40.500	19.28	22.212	1.40	25.879	24.60
16.7	49.29	49.47	40.796	20.29	22.490	1.53	26.183	24.99
26.6	50.01	51.43	41.075	21.23	22.747	2.12	26.466	25.94
Oct. 6.6	50.68	53.68	41.331	22.09	22.982	3.15	26.722	27.38
16.6	51.26	56.19	41.565	22.85	23.189	4.58	26.946	29.26
26.6	51.77	58.89	41.772	23.51	23.368	6.37	27.136	31.54
Nov. 5.5	52.21	61.73	41.951	24.08	23.514	8.43	27.286	34.12
15.5	52.53	64.66	42.098	24.55	23.625	10.67	27.395	36.88
25.5	52.75	67.59	42.211	24.95	23.700	13.01	27.460	39.75
Dec. 5.5	52.85	70.47	42.287	25.26	23.738	15.35	27.482	42.60
15.4	52.84	73.22	42.325	25.48	23.738	17.63	27.459	45.33
25.4	52.70	75.72	42.324	25.62	23.699	19.75	27.392	47.85
35.4	52.45	77.90	42.283	25.68	23.623	21.67	27.283	50.08
Mean Place	40.749	51.86	36.405	8.98	19.175	25.91	23.169	51.88
Sec δ, Tan δ	3.085	+2.918	1.093	+0.442	1.090	-0.435	1.243	-0.738
Dψ α, Dω α	+0.12	-0.11	+0.07	-0.02	+0.05	+0.02	+0.04	+0.03
Dψ δ, Dω δ	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	γ Hydr. Mag. 3.2		ζ Persei. Mag. 2.9		θ H. Camelop. Mag. 5.2		ε Persei. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m s 48	° ' " 28	h m s 48	° ' " 38	h m s 50	° ' " 52	h m s 52	° ' " 46
n. 0.4	32.96	95.89	60.922	37.60	11.93	26.56	23.561	37.76
10.4	32.30	97.97	60.858	37.97	11.76	28.21	23.487	38.50
20.3	31.55	99.53	60.754	38.16	11.63	29.49	23.369	39.03
30.3	30.73	100.52	60.616	38.18	11.24	30.35	23.212	39.30
b. 9.3	29.87	100.92	60.450	38.01	10.91	30.75	23.025	39.31
19.2	28.98	100.75	60.266	37.66	10.55	30.69	22.816	39.04
ur. 1.2	28.10	100.02	60.074	37.12	10.18	30.17	22.599	38.51
11.2	27.25	98.75	59.886	36.41	9.82	29.21	22.387	37.73
21.2	26.45	96.98	59.715	35.59	9.49	27.84	22.192	36.74
31.1	25.72	94.76	59.570	34.67	9.21	26.13	22.027	35.58
ur. 10.1	25.09	92.14	59.461	33.71	9.00	24.17	21.901	34.32
20.1	24.56	89.20	59.396	32.76	8.86	22.01	21.824	33.00
30.1	24.16	85.99	59.382	31.87	8.80	19.77	21.801	31.69
ly 10.0	23.88	82.59	59.420	31.07	8.83	17.51	21.837	30.45
20.0	23.73	79.06	59.512	30.42	8.95	15.32	21.931	29.33
30.0	23.74	75.51	59.656	29.94	9.15	13.29	22.082	28.37
ne 8.9	23.88	72.03	59.848	29.66	9.45	11.45	22.287	27.61
18.9	24.16	68.67	60.083	29.58	9.81	9.89	22.540	27.07
28.9	24.56	65.54	60.356	29.70	10.24	8.63	22.834	26.77
ly 8.9	25.09	62.71	60.660	30.04	10.71	7.70	23.161	26.71
18.8	25.72	60.28	60.985	30.56	11.23	7.13	23.515	26.90
28.8	26.42	58.32	61.325	31.26	11.78	6.93	23.885	27.30
ig. 7.8	27.19	56.90	61.674	32.09	12.34	7.09	24.266	27.93
17.8	28.00	56.04	62.024	33.04	12.92	7.60	24.660	28.73
27.7	28.82	55.79	62.369	34.07	13.49	8.45	25.029	29.69
pt. 6.7	29.63	56.17	62.705	35.15	14.04	9.62	25.398	30.80
16.7	30.41	57.19	63.026	36.26	14.58	11.08	25.751	32.00
26.6	31.13	58.79	63.327	37.38	15.08	12.80	26.087	33.29
t. 6.6	31.75	60.94	63.608	38.48	15.55	14.75	26.398	34.63
16.6	32.27	63.58	63.864	39.55	15.98	16.90	26.683	36.02
26.6	32.67	66.59	64.093	40.58	16.35	19.20	26.938	37.42
iv. 5.5	32.93	69.87	64.291	41.56	16.67	21.61	27.159	38.82
15.5	33.03	73.31	64.456	42.49	16.92	24.08	27.344	40.20
25.5	32.99	76.77	64.584	43.35	17.11	26.56	27.486	41.54
ic. 5.5	32.79	80.13	64.673	44.13	17.22	28.98	27.584	42.81
15.4	32.44	83.27	64.720	44.81	17.26	31.28	27.635	43.96
25.4	31.97	86.09	64.722	45.39	17.22	33.37	27.637	45.00
35.4	31.38	88.48	64.681	45.84	17.10	35.21	27.590	45.87
Place	29.551	85.94	58.402	28.07	8.030	11.88	20.805	26.79
Tan δ	3.739	-3.603	1.175	+0.616	2.054	+1.795	1.301	+0.832
D _α α	-0.02	+0.13	+0.07	-0.02	+0.10	-0.06	+0.08	-0.03
D _α δ	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Persei. Mag. 4.0		γ Eridani. Mag. 3.2		λ Tauri. Var. 3.3-4.2		δ Reticuli. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 53	° ' " +35 33	h m 3 54	° ' " -13 44	h m 3 56	° ' " +12 15	h m 3 57	° ' " -61 37
	s	"	s	"	s	"	s	"
Jan. 0.4	41.058	32.19	14.233	28.64	10.359	39.29	29.03	60.96
10.4	40.993	32.75	14.163	30.15	10.311	38.79	28.72	63.26
20.3	40.885	33.12	14.059	31.43	10.226	38.30	28.35	65.07
30.3	40.741	33.28	13.928	32.46	10.110	37.82	27.94	66.34
Feb. 9.3	40.566	33.22	13.772	33.21	9.969	37.35	27.50	67.05
19.3	40.372	32.92	13.601	33.68	9.811	36.91	27.04	67.19
Mar. 1.2	40.169	32.40	13.423	33.84	9.644	36.51	26.57	66.76
11.2	39.970	31.68	13.247	33.71	9.480	36.14	26.12	65.79
21.2	39.786	30.79	13.084	33.29	9.328	35.84	25.69	64.30
31.1	39.630	29.78	12.940	32.58	9.195	35.63	25.29	62.35
Apr. 10.1	39.512	28.68	12.826	31.59	9.094	35.51	24.95	59.97
20.1	39.439	27.56	12.749	30.33	9.030	35.51	24.67	57.23
30.1	39.418	26.46	12.712	28.81	9.009	35.66	24.48	54.19
May 10.0	39.451	25.45	12.719	27.08	9.033	35.98	24.34	50.92
20.0	39.541	24.56	12.773	25.16	9.104	36.45	24.29	47.49
30.0	39.685	23.84	12.871	23.08	9.221	37.10	24.32	43.97
June 8.9	39.880	23.30	13.013	20.90	9.381	37.90	24.44	40.47
18.9	40.120	22.99	13.193	18.67	9.581	38.84	24.63	37.06
28.9	40.399	22.89	13.409	16.45	9.813	39.91	24.90	33.83
July 8.9	40.711	23.00	13.654	14.30	10.074	41.07	25.23	30.88
18.8	41.046	23.34	13.921	12.27	10.355	42.27	25.62	28.28
28.8	41.399	23.86	14.204	10.43	10.651	43.48	26.06	26.11
Aug. 7.8	41.761	24.57	14.497	8.85	10.956	44.66	26.53	24.44
17.8	42.125	25.42	14.793	7.58	11.262	45.77	27.01	23.32
27.7	42.486	26.39	15.087	6.64	11.564	46.78	27.51	22.82
Sept. 6.7	42.836	27.45	15.373	6.09	11.859	47.65	28.00	22.94
16.7	43.173	28.58	15.647	5.96	12.142	48.35	28.47	23.68
26.6	43.492	29.77	15.903	6.22	12.410	48.87	28.91	25.05
Oct. 6.6	43.788	30.97	16.140	6.87	12.658	49.21	29.31	26.98
16.6	44.060	32.17	16.353	7.87	12.886	49.36	29.65	29.42
26.6	44.303	33.36	16.541	9.20	13.089	49.35	29.91	32.27
Nov. 5.5	44.515	34.53	16.699	10.78	13.267	49.20	30.11	35.45
15.5	44.692	35.66	16.827	12.54	13.415	48.91	30.24	38.82
25.5	44.831	36.74	16.923	14.43	13.532	48.54	30.28	42.27
Dec. 5.5	44.928	37.75	16.982	16.35	13.615	48.10	30.24	45.68
15.4	44.980	38.67	17.005	18.24	13.662	47.62	30.11	48.92
25.4	44.986	39.47	16.991	20.04	13.670	47.12	29.92	51.88
35.4	44.945	40.12	16.942	21.67	13.641	46.61	29.65	54.46
Mean Place	38.417	22.15	12.188	27.57	8.124	34.49	26.509	52.16
Sec δ , Tan δ	1.229	+0.715	1.029	-0.244	1.023	+0.217	2.104	-1.852
$D\psi\alpha$, $D\omega\alpha$	+0.08	-0.03	+0.06	+0.01	+0.07	-0.01	+0.02	+0.06
$D\psi\delta$, $D\omega\delta$	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	γ Tauri. Mag. 3.9		Δ Tauri. Mag. 4.5		ε Persei. Mag. 4.0		δ Tauri. Mag. 5.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 58	° ' " + 5 45	h m 3 59	° ' " +21 51	h m 4 2	° ' " +47 29	h m 4 5	° ' " +26 16
a. 0.4	49.750	48.83	53.085	38.71	45.306	52.79	52.516	11.98
10.4	49.702	48.05	53.018	38.65	45.225	53.94	52.471	12.13
20.3	49.618	47.34	52.932	38.51	45.091	54.83	52.385	12.19
30.3	49.503	46.70	52.813	38.29	44.911	55.40	52.263	12.13
b. 9.3	49.364	46.14	52.667	38.00	44.693	55.65	52.113	11.94
19.3	49.207	45.67	52.501	37.63	44.451	55.56	51.941	11.64
r. 1.2	49.041	45.31	52.326	37.19	44.197	55.13	51.758	11.21
11.2	48.878	45.07	52.153	36.69	43.946	54.37	51.576	10.69
21.2	48.724	44.94	51.992	36.15	43.713	53.32	51.407	10.08
31.1	48.591	44.95	51.852	35.61	43.512	52.02	51.258	9.41
r. 10.1	48.488	45.12	51.745	35.09	43.354	50.55	51.142	8.73
20.1	48.421	45.44	51.677	34.62	43.250	48.95	51.068	8.07
30.1	48.395	45.94	51.653	34.25	43.207	47.29	51.036	7.47
ty 10.0	48.413	46.62	51.677	34.01	43.227	45.67	51.056	6.96
20.0	48.477	47.47	51.751	33.91	43.315	44.11	51.126	6.59
30.0	48.587	48.48	51.873	33.96	43.466	42.69	51.246	6.37
ne 9.0	48.739	49.65	52.040	34.19	43.677	41.46	51.412	6.32
18.9	48.928	50.93	52.249	34.59	43.944	40.44	51.622	6.45
28.9	49.152	52.30	52.493	35.15	44.260	39.68	51.869	6.74
ly 8.9	49.404	53.71	52.766	35.86	44.616	39.18	52.147	7.20
18.8	49.677	55.13	53.061	36.67	45.001	38.97	52.449	7.79
28.8	49.965	56.52	53.373	37.57	45.411	39.02	52.767	8.52
ig. 7.8	50.261	57.82	53.693	38.53	45.833	39.34	53.096	9.34
17.8	50.560	58.97	54.016	39.51	46.261	39.90	53.429	10.21
27.7	50.856	59.97	54.336	40.48	46.687	40.70	53.759	11.12
pt. 6.7	51.145	60.75	54.648	41.41	47.106	41.69	54.083	12.03
16.7	51.423	61.32	54.948	42.27	47.509	42.88	54.396	12.92
26.7	51.684	61.64	55.232	43.05	47.894	44.22	54.692	13.77
t. 6.6	51.928	61.72	55.497	43.72	48.254	45.69	54.971	14.56
16.6	52.152	61.57	55.741	44.29	48.586	47.27	55.228	15.27
26.6	52.351	61.21	55.961	44.76	48.884	48.95	55.461	15.93
iv. 5.5	52.524	60.68	56.154	45.14	49.145	50.67	55.666	16.52
15.5	52.670	60.00	56.317	45.43	49.363	52.41	55.841	17.05
25.5	52.784	59.22	56.446	45.63	49.534	54.15	55.982	17.52
xc. 5.5	52.865	58.38	56.541	45.78	49.654	55.85	56.085	17.92
15.4	52.911	57.51	56.596	45.87	49.719	57.45	56.149	18.27
25.4	52.918	56.65	56.610	45.89	49.728	58.92	56.169	18.55
35.4	52.889	55.83	56.584	45.86	49.675	60.20	56.147	18.75
1 Place	47.571	45.62	50.682	31.94	42.192	41.18	50.027	4.61
2, Tan δ	1.005	+0.101	1.078	+0.401	1.480	+1.091	1.115	+0.494
, D _α	+0.06	0.00	+0.07	-0.01	+0.09	-0.04	+0.07	-0.02
, D _δ	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α^1 Eridani. Mag. 4.1		μ Tauri. Mag. 4.3		α Horologii. Mag. 3.8		α Retenuli. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 7	° ' -7 2	h m 4 11	° ' +8 41	h m 4 11	° ' -42 29	h m 4 13	° ' -62 40
	s	"	s	"	s	"	s	"
Jan. 0.4	53.838	61.58	7.053	19.97	19.239	53.00	24.50	52.30
10.4	53.786	62.91	7.014	19.29	19.102	55.34	24.20	54.78
20.3	53.698	64.06	6.938	18.66	18.922	57.28	23.83	56.79
30.3	53.579	65.03	6.829	18.09	18.706	58.77	23.41	58.25
Feb. 9.3	53.435	65.77	6.694	17.58	18.462	59.77	22.95	59.21
19.3	53.272	66.29	6.539	17.14	18.197	60.27	22.47	59.58
Mar. 1.2	53.100	66.56	6.371	16.77	17.924	60.26	21.98	59.38
11.2	52.927	66.61	6.204	16.47	17.652	59.76	21.49	58.63
21.2	52.765	66.41	6.046	16.29	17.393	58.79	21.02	57.35
31.2	52.620	65.98	5.906	16.20	17.157	57.38	20.61	55.59
Apr. 10.1	52.504	65.30	5.795	16.24	16.956	55.55	20.23	53.39
20.1	52.422	64.39	5.719	16.41	16.794	53.34	19.91	50.80
30.1	52.380	63.24	5.684	16.74	16.680	50.80	19.66	47.87
May 10.0	52.380	61.90	5.692	17.22	16.619	48.01	19.49	44.69
20.0	52.426	60.36	5.746	17.88	16.613	45.00	19.40	41.33
30.0	52.517	58.65	5.846	18.68	16.665	41.87	19.40	37.86
June 9.0	52.650	56.83	5.988	19.63	16.771	38.69	19.48	34.36
18.9	52.823	54.93	6.171	20.71	16.929	35.51	19.64	30.91
28.9	53.031	52.99	6.389	21.90	17.135	32.44	19.88	27.62
July 8.9	53.267	51.08	6.635	23.14	17.384	29.55	20.32	24.58
18.9	53.527	49.24	6.904	24.40	17.668	26.94	20.57	21.87
28.8	53.804	47.55	7.189	25.66	17.981	24.68	21.00	19.56
Aug. 7.8	54.092	46.04	7.485	26.84	18.314	22.83	21.47	17.74
17.8	54.384	44.79	7.785	27.94	18.660	21.47	21.97	16.47
27.7	54.676	43.81	8.085	28.89	19.011	20.64	22.48	15.79
Sept. 6.7	54.962	43.17	8.379	29.66	19.358	20.38	22.99	15.74
16.7	55.238	42.87	8.663	30.24	19.693	20.71	23.48	16.32
26.7	55.499	42.91	8.934	30.61	20.011	21.63	23.95	17.53
Oct. 6.6	55.743	43.31	9.187	30.76	20.303	23.08	24.37	19.33
16.6	55.967	44.04	9.421	30.70	20.565	25.04	24.75	21.66
26.6	56.166	45.04	9.633	30.45	20.789	27.43	25.06	24.44
Nov. 5.6	56.340	46.30	9.821	30.04	20.973	30.17	25.29	27.58
15.5	56.486	47.73	9.980	29.49	21.112	33.16	25.45	30.96
25.5	56.599	49.28	10.108	28.85	21.203	36.28	25.53	34.44
Dec. 5.5	56.678	50.89	10.204	28.14	21.244	39.42	25.50	37.92
15.4	56.722	52.49	10.263	27.41	21.234	42.45	25.41	41.27
25.4	56.727	54.03	10.284	26.69	21.173	45.31	25.23	44.37
35.4	56.694	55.46	10.264	25.98	21.064	47.87	24.97	47.13
Mean Place	51.716	61.75	4.800	16.55	17.059	46.78	21.837	43.96
Sec δ , Tan δ	1.008	-0.124	1.012	+0.153	1.356	-0.916	2.179	-1.936
$D\alpha$, D_{α}	+0.06	0.00	+0.06	0.00	+0.04	+0.03	+0.02	+0.06
$D\delta$, D_{δ}	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	γ Tauri. Mag. 3.9			δ Tauri. Mag. 3.9			ν^5 Eridani. Mag. 4.1			δ Menes. Mag. 5.6		
	Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.	
	h m	s		h m	s		h m	s		h m	s	
	4 15	+15 25		4 18	+17 21		4 20	-34 11		4 23	-80 23	
	s	"		s	"		s	"		s	"	
a. 0.4	9.839	54.79		14.601	9.17		59.543	88.99		34.18	94.21	
10.4	9.804 ³⁵	54.43 ³⁶		14.569 ³²	8.91 ²⁶		59.448 ⁹⁵	91.25 ²²⁶		33.17 ¹⁰¹	96.64 ²⁴³	
20.3	9.732 ⁷²	54.07 ³⁶		14.497 ⁷²	8.62 ²⁹		59.310 ¹³⁸	93.17 ¹⁹²		31.98 ¹¹⁹	98.60 ¹⁹⁶	
30.3	9.623 ¹⁰⁹	53.70 ³⁷		14.389 ¹⁰⁸	8.32 ³⁰		59.137 ¹⁷³	94.68 ¹⁵¹		30.67 ¹³¹	100.03 ¹⁴³	
b. 9.3	9.487 ¹³⁶	53.33 ³⁷		14.252 ¹³⁷	7.99 ³³		58.935 ²⁰²	95.75 ¹⁰⁷		29.25 ¹⁴²	100.93 ⁹⁰	
	159	38		160	35		222	63		147	34	
19.3	9.328	52.95		14.092	7.64		58.713	96.38		27.78	101.27	
ar. 1.2	9.159 ¹⁶⁹	52.57 ³⁸		13.921 ¹⁷¹	7.27 ³⁷		58.479 ²³⁴	96.55 ¹⁷		26.29 ¹⁴⁹	101.03 ²⁴	
11.2	8.988 ¹⁷¹	52.20 ³⁷		13.747 ¹⁷⁴	6.89 ³⁸		58.244 ²³⁵	96.27 ²⁸		24.82 ¹⁴⁷	100.27 ⁷⁶	
21.2	8.826 ¹⁶²	51.86 ³⁴		13.582 ¹⁶⁵	6.51 ³⁸		58.018 ²²⁶	95.55 ⁷²		23.40 ¹⁴²	98.98 ¹²⁹	
31.2	8.682 ¹⁴⁴	51.56 ³⁰		13.436 ¹⁴⁶	6.15 ³⁶		57.812 ²⁰⁶	94.40 ¹¹⁵		22.07 ¹³³	97.22 ¹⁷⁶	
	115	23		118	30		178	153		120	219	
pr. 10.1	8.567 ⁷⁸	51.33 ¹⁴		13.318 ⁸²	5.85 ²²		57.634 ¹⁴²	92.87 ¹⁸⁹		20.87 ¹⁰⁶	95.03 ²⁵⁶	
20.1	8.489 ³⁸	51.19 ³		13.236 ³⁹	5.63 ¹⁴		57.492 ⁹⁸	90.98 ²²¹		19.81 ⁸⁸	92.47 ²⁸⁶	
30.1	8.451 ⁷	51.16 ¹⁰		13.197 ⁶	5.49 ¹		57.394 ⁵⁰	88.77 ²⁴⁸		18.93 ⁶⁹	89.61 ⁸¹²	
ay 10.0	8.458 ⁵⁴	51.26 ²⁵		13.203 ⁵³	5.48 ¹³		57.344 ⁰	86.29 ²⁷⁰		18.24 ⁴⁸	86.49 ³³⁰	
20.0	8.512 ¹⁰²	51.51 ⁴⁰		13.256 ¹⁰⁰	5.61 ²⁸		57.344 ⁵¹	83.59 ²⁸⁶		17.76 ²⁶	83.19 ³³⁹	
30.0	8.614 ¹⁴⁶	51.91 ⁵⁵		13.356 ¹⁴⁶	5.89 ⁴³		57.395 ¹⁰¹	80.73 ²⁹⁴		17.50 ⁴	79.80 ⁸⁴¹	
ne 9.0	8.760 ¹⁸⁶	52.46 ⁶⁹		13.502 ¹⁸⁵	6.32 ⁵⁷		57.496 ¹⁴⁸	77.79 ²⁹⁶		17.46 ¹⁹	76.39 ³³⁵	
18.9	8.946 ²²³	53.15 ⁸¹		13.687 ²²³	6.89 ⁷¹		57.644 ¹⁹²	74.83 ²⁹⁰		17.65 ⁴⁰	73.04 ³¹⁹	
28.9	9.169 ²⁵³	53.96 ⁹²		13.910 ²⁵³	7.60 ⁸¹		57.836 ²²⁹	71.93 ²⁷⁶		18.05 ⁶²	69.85 ²⁹⁶	
ly 8.9	9.422 ²⁷⁵	54.88 ⁹⁸		14.163 ²⁷⁷	8.41 ⁸⁹		58.065 ²⁶³	69.17 ²⁵³		18.67 ⁷⁹	66.89 ²⁶¹	
18.9	9.697 ²⁹³	55.86 ¹⁰²		14.440 ²⁹⁴	9.30 ⁹³		58.328 ²⁸⁷	66.64 ²²⁴		19.46 ⁹⁵	64.28 ²²²	
28.8	9.990 ³⁰⁵	56.88 ¹⁰²		14.734 ³⁰⁷	10.23 ⁹⁵		58.615 ³⁰⁷	64.40 ¹⁸⁸		20.41 ¹¹⁰	62.06 ¹⁷²	
ug. 7.8	10.295 ³⁰⁹	57.90 ⁹⁷		15.041 ³¹¹	11.18 ⁹³		58.922 ³¹⁸	62.52 ¹⁴³		21.51 ¹²⁰	60.34 ¹²²	
17.8	10.604 ³⁰⁸	58.87 ⁹⁰		15.352 ³¹¹	12.11 ⁸⁷		59.240 ³²²	61.09 ⁹⁵		22.71 ¹²⁶	59.12 ⁶¹	
27.7	10.912 ³⁰²	59.77 ⁸⁰		15.663 ³⁰⁶	12.98 ⁷⁹		59.562 ³²⁰	60.14 ⁴²		23.97 ¹²⁸	58.51 ¹	
pt. 6.7	11.214 ²⁹⁴	60.57 ⁶⁶		15.969 ²⁹⁸	13.77 ⁶⁶		59.882 ³¹²	59.72 ¹¹		25.25 ¹²⁶	58.50 ⁶⁴	
16.7	11.508 ²⁸⁰	61.23 ⁵³		16.267 ²⁸⁵	14.43 ⁵⁵		60.194 ²⁹⁷	59.83 ⁶⁶		26.51 ¹¹⁹	59.14 ¹²⁴	
26.7	11.788 ²⁶⁴	61.75 ³⁷		16.552 ²⁶⁹	14.98 ⁴²		60.491 ²⁷⁷	60.49 ¹¹⁹		27.70 ¹¹⁰	60.38 ¹⁸¹	
t. 6.6	12.052 ²⁴⁶	62.12 ²¹		16.821 ²⁵¹	15.40 ²⁶		60.768 ²⁵¹	61.68 ¹⁶⁷		28.80 ⁹⁴	62.19 ²³⁵	
16.6	12.298 ²²⁴	62.33 ⁷		17.072 ²²⁹	15.66 ¹⁵		61.019 ²²¹	63.35 ²¹⁰		29.74 ⁷⁶	64.54 ²⁷⁹	
26.6	12.522 ¹⁹⁷	62.40 ⁶		17.301 ²⁰⁴	15.81 ⁴		61.240 ¹⁸⁹	65.45 ²⁴⁶		30.50 ⁵⁵	67.33 ³¹⁴	
v. 5.6	12.719 ¹⁷⁰	62.34 ¹⁶		17.505 ¹⁷⁵	15.85 ⁵		61.429 ¹⁴⁹	67.91 ²⁷⁰		31.05 ³¹	70.47 ³³⁶	
15.5	12.889 ¹⁴⁰	62.18 ²⁵		17.680 ¹⁴⁵	15.80 ¹³		61.578 ¹⁰⁹	70.61 ²⁸⁵		31.36 ⁸	73.83 ³⁴⁶	
25.5	13.029 ¹⁰⁴	61.93 ²⁹		17.825 ¹¹⁰	15.67 ¹⁸		61.687 ⁶⁵	73.46 ²⁹⁰		31.44 ²⁰	77.29 ⁸⁴⁴	
c. 5.5	13.133 ⁶⁷	61.64 ³⁴		17.935 ⁷¹	15.49 ²³		61.752 ²⁰	76.36 ²⁸⁵		31.24 ⁴³	80.73 ³³³	
15.4	13.200 ²⁸	61.30 ³⁵		18.006 ⁸¹	15.26 ²⁵		61.772 ²⁶	79.21 ²⁷⁰		30.81 ⁶⁸	84.06 ³⁰⁶	
25.4	13.228 ¹²	60.95 ³⁶		18.037 ¹⁰	15.01 ²⁶		61.746 ⁷²	81.91 ²⁴⁵		30.13 ⁸⁸	87.12 ²⁷¹	
35.4	13.216	60.59		18.027	14.75		61.674	84.36		29.25	89.83	
Place	7.489	50.15		12.212	4.29		57.392	84.13		28.841	85.54	
l, Tan δ	1.038	+0.276		1.048	+0.312		1.209	-0.680		6.000	-5.916	
D _a	+0.07	-0.01		+0.07	-0.01		+0.04	+0.02		-0.08	+0.16	
D _s	+0.2	+0.9		+0.2	+0.9		+0.2	+0.9		+0.2	+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Tauri. Mag. 3.6		m Persei. Mag. 6.1		α Tauri. (Aldebaran.) Mag. 1.1		γ Eridani. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 23	° ' " +18 59	h m 4 27	° ' " +42 53	h m 4 31	° ' " +16 20	h m 4 32	° ' " - 3 30
	s	"	s	"	s	"	s	"
Jan. 0.4	52.023	63.49	41.530	32.74	15.220	47.73	15.449	68.60
10.4	51.995	63.30	41.488	33.76	15.198	47.41	15.417	69.88
20.4	51.926	63.09	41.392	34.61	15.135	47.09	15.347	70.99
30.3	51.821	62.85	41.248	35.22	15.035	46.77	15.242	71.95
Feb. 9.3	51.685	62.57	41.064	35.56	14.902	46.44	15.109	72.72
19.3	51.524	62.25	40.850	35.63	14.746	46.10	14.952	73.30
Mar. 1.2	51.351	61.90	40.620	35.41	14.575	45.76	14.781	73.67
11.2	51.175	61.52	40.385	34.92	14.399	45.42	14.606	73.83
21.2	51.007	61.13	40.161	34.15	14.231	45.09	14.438	73.79
31.2	50.856	60.74	39.960	33.16	14.078	44.79	14.283	73.53
Apr. 10.1	50.734	60.38	39.796	31.98	13.953	44.55	14.154	73.06
20.1	50.647	60.09	39.676	30.69	13.860	44.37	14.056	72.37
30.1	50.603	59.87	39.609	29.32	13.809	44.28	13.997	71.48
May 10.1	50.604	59.77	39.601	27.95	13.803	44.31	13.980	70.38
20.0	50.653	59.79	39.654	26.62	13.844	44.47	14.006	69.11
30.0	50.749	59.95	39.766	25.38	13.931	44.78	14.077	67.68
June 9.0	50.889	60.27	39.935	24.29	14.062	45.21	14.191	66.11
18.9	51.073	60.72	40.158	23.37	14.236	45.78	14.345	64.44
28.9	51.293	61.30	40.428	22.66	14.447	46.48	14.535	62.72
July 8.9	51.545	62.01	40.739	22.16	14.687	47.27	14.756	61.00
18.9	51.821	62.80	41.082	21.89	14.955	48.13	15.002	59.34
28.8	52.115	63.65	41.449	21.83	15.241	49.02	15.268	57.77
Aug. 7.8	52.422	64.52	41.834	21.99	15.540	49.92	15.548	56.36
17.8	52.735	65.38	42.228	22.35	15.847	50.78	15.834	55.16
27.8	53.050	66.21	42.626	22.89	16.156	51.58	16.124	54.21
Sept. 6.7	53.380	66.96	43.020	23.61	16.462	52.27	16.413	53.54
16.7	53.661	67.62	43.406	24.46	16.761	52.86	16.695	53.19
26.7	53.952	68.17	43.778	25.44	17.050	53.31	16.967	53.16
Oct. 6.6	54.227	68.60	44.132	26.52	17.325	53.60	17.224	53.46
16.6	54.484	68.91	44.463	27.71	17.582	53.77	17.465	54.07
26.6	54.721	69.10	44.768	28.96	17.821	53.80	17.685	54.95
Nov. 5.6	54.932	69.20	45.040	30.28	18.035	53.72	17.882	56.07
15.5	55.116	69.22	45.278	31.63	18.222	53.54	18.052	57.37
25.5	55.268	69.17	45.473	33.00	18.378	53.29	18.192	58.79
Dec. 5.5	55.384	69.08	45.621	34.37	18.500	53.00	18.298	60.27
15.5	55.463	68.95	45.718	35.69	18.584	52.69	18.367	61.77
25.4	55.500	68.80	45.760	36.94	18.627	52.36	18.397	63.22
35.4	55.494	68.62	45.748	38.05	18.628	52.03	18.387	64.57
Mean Place	49.587	58.56	38.472	23.86	12.798	43.69	13.227	68.93
Sec δ , Tan δ	1.058	+0.344	1.365	+0.929	1.042	+0.293	1.002	-0.061
D_{α} , $D_{\alpha\alpha}$	+0.07	-0.01	+0.08	-0.02	+0.07	-0.01	+0.06	0.00
D_{γ} , $D_{\gamma\gamma}$	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.1	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Doradus. Mag. 3.5		53 Eridani. Mag. 4.0		τ Tauri. Mag. 4.3		Groombridge 848. Mag. 6.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 32	° ' " -55 12	h m 4 34	° ' " -14 27	h m 4 37	° ' " +22 48	h m 4 37	° ' " +75 47
Jan. 0.4	15.894	58.47	27.569	49.90	21.840	7.26	54.05	50.73
10.4	15.698 ¹⁹⁶	61.14 ²⁶⁷	27.527 ⁴²	51.65 ¹⁷⁵	21.823 ¹⁷	7.27 ¹	53.79 ²⁶	53.24 ²⁵¹
20.4	15.445 ²⁵³	63.39 ²²⁵	27.445 ⁸²	53.16 ¹⁵¹	21.762 ⁶¹	7.25 ²	53.38 ⁴¹	55.42 ²¹⁸
30.3	15.144 ³⁰¹	65.16 ¹⁷⁷	27.328 ¹¹⁷	54.42 ¹²⁶	21.661 ¹⁰¹	7.18 ⁷	52.82 ⁵⁶	57.19 ¹⁷⁷
Feb. 9.3	14.804 ³⁴⁰	66.41 ¹²⁵	27.182 ¹⁴⁶	55.41 ⁹⁹	21.527 ¹³⁴	7.04 ¹⁴	52.15 ⁶⁷	58.47 ¹²⁸
19.3	14.437 ³⁶⁷	67.11 ⁷⁰	27.012 ¹⁷⁰	56.09 ⁶⁸	21.365 ¹⁶²	6.82 ²³	51.41 ⁷⁴	59.22 ⁷⁶
Mar. 1.3	14.055 ³⁸²	67.27 ¹⁶	26.829 ¹⁸³	56.46 ³⁷	21.188 ¹⁷⁷	6.54 ²⁸	50.62 ⁷⁹	59.41 ¹⁹
11.2	13.671 ³⁸⁴	66.88 ³⁹	26.642 ¹⁸⁷	56.54 ⁸	21.005 ¹⁸³	6.18 ³⁶	49.82 ⁸⁰	59.03 ³⁸
21.2	13.299 ³⁷²	65.96 ⁹²	26.460 ¹⁸²	56.30 ²⁴	20.827 ¹⁷⁸	5.77 ⁴¹	49.06 ⁷⁶	58.11 ⁹²
31.2	12.953 ³⁴⁶	64.54 ¹⁴²	26.294 ¹⁶⁶	55.77 ⁵³	20.666 ¹⁶¹	5.32 ⁴⁵	48.35 ⁷¹	56.67 ¹⁴⁴
Apr. 10.1	12.643 ³¹⁰	62.68 ¹⁸⁶	26.151 ¹⁴³	54.93 ⁸⁴	20.531 ¹³⁵	4.86 ⁴⁶	47.74 ⁶¹	54.82 ¹⁸⁵
20.1	12.380 ²⁶³	60.39 ²²⁹	26.041 ¹¹⁰	53.82 ¹¹¹	20.432 ⁹⁹	4.42 ⁴⁴	47.27 ⁴⁷	52.59 ²²³
30.1	12.172 ²⁰⁸	57.75 ²⁶⁴	25.968 ⁷³	52.45 ¹³⁷	20.375 ⁵⁷	4.02 ⁴⁰	46.93 ³⁴	50.09 ²⁵⁰
May 10.1	12.028 ¹⁴⁴	54.81 ²⁰⁴	25.938 ³⁰	50.84 ¹⁶¹	20.364 ¹¹	3.71 ³¹	46.76 ¹⁷	47.42 ²⁶⁷
20.0	11.949 ⁷⁹	51.65 ³¹⁴	25.952 ¹⁴	49.02 ¹⁸²	20.401 ³⁷	3.50 ²¹	46.76 ⁰	44.65 ²⁷⁷
30.0	11.941 ⁸	48.32 ³³³	26.011 ⁵⁹	47.04 ¹⁹⁸	20.487 ⁸⁶	3.40 ¹⁰	46.91 ¹⁵	41.89 ²⁷⁶
June 9.0	12.002 ⁶¹	44.92 ³⁴⁰	26.114 ¹⁰³	44.92 ²¹²	20.619 ¹³²	3.44 ⁴	47.23 ³²	39.22 ²⁶⁷
19.0	12.130 ¹²⁸	41.53 ³³⁹	26.258 ¹⁴⁴	42.74 ²¹⁸	20.795 ¹⁷⁶	3.63 ¹⁹	47.71 ⁴⁸	36.71 ²⁵¹
28.9	12.323 ¹⁹³	38.23 ³³⁰	26.440 ¹⁸²	40.54 ²²⁰	21.009 ²¹⁴	3.94 ³¹	48.32 ⁶¹	34.44 ²²⁷
July 8.9	12.575 ²⁵²	35.13 ³¹⁰	26.655 ²¹⁵	38.37 ²¹⁷	21.257 ²⁴⁸	4.37 ⁴³	49.06 ⁷⁴	32.45 ¹⁹⁹
18.9	12.879 ³⁰⁴	32.30 ²⁸³	26.895 ²⁴⁰	36.33 ²⁰⁴	21.530 ²⁷³	4.91 ⁵⁴	49.91 ⁸⁵	30.81 ¹⁶⁴
28.8	13.226 ³⁴⁷	29.84 ²⁴⁶	27.159 ²⁶⁴	34.45 ¹⁸⁸	21.825 ²⁹⁵	5.53 ⁶²	50.85 ⁹⁴	29.54 ¹²⁷
Aug. 7.8	13.608 ³⁸²	27.82 ²⁰²	27.437 ²⁷⁸	32.81 ¹⁶⁴	22.135 ³¹⁰	6.21 ⁶⁸	51.85 ¹⁰⁰	28.66 ⁸⁸
17.8	14.016 ⁴⁰⁸	26.31 ¹⁵¹	27.724 ²⁶⁷	31.46 ¹³⁵	22.452 ³¹⁷	6.90 ⁶⁹	52.90 ¹⁰⁵	28.19 ⁴⁷
27.8	14.438 ⁴²²	25.37 ⁹⁴	28.016 ²⁹²	30.46 ¹⁰⁰	22.773 ³²¹	7.60 ⁷⁰	53.98 ¹⁰⁸	28.14 ⁵
Sept. 6.7	14.864 ⁴²⁶	25.03 ³⁴	28.306 ²⁹⁰	29.84 ⁶²	23.092 ³¹⁹	8.26 ⁶⁶	55.06 ¹⁰⁸	28.51 ³⁷
16.7	15.284 ⁴²⁰	25.32 ²⁹	28.591 ²⁸⁵	29.63 ²¹	23.405 ³¹³	8.87 ⁶¹	56.14 ¹⁰⁸	29.29 ⁷⁸
26.7	15.685 ⁴⁰¹	26.25 ⁹³	28.865 ²⁷⁴	29.84 ²¹	23.708 ³⁰³	9.41 ⁵⁴	57.19 ¹⁰⁵	30.47 ¹¹⁸
Oct. 6.7	16.059 ³⁷⁴	27.77 ¹⁵²	29.124 ²⁵⁹	30.46 ⁶²	23.998 ²⁰⁸	9.87 ⁴⁶	58.18 ⁹⁹	32.02 ¹⁵⁵
16.6	16.396 ³³⁷	29.85 ²⁰⁸	29.366 ²⁴²	31.47 ¹⁰¹	24.272 ²⁷⁴	10.24 ³⁷	59.11 ⁹³	33.91 ¹⁸⁹
26.6	16.687 ²⁹¹	32.42 ²⁵⁷	29.586 ²²⁰	32.82 ¹³⁵	24.525 ²⁵³	10.54 ³⁰	59.96 ⁸⁵	36.13 ²²²
Nov. 5.6	16.925 ²³⁸	35.38 ²⁹⁶	29.782 ¹⁹⁶	34.47 ¹⁶⁵	24.755 ²³⁰	10.76 ²²	60.70 ⁷⁴	38.62 ²⁴⁹
15.5	17.104 ¹⁷⁹	38.62 ³²⁴	29.948 ¹⁶⁶	36.33 ¹⁸⁶	24.956 ²⁰¹	10.94 ¹⁸	61.33 ⁶³	41.32 ²⁷⁰
25.5	17.219 ¹¹⁵	42.04 ³⁴²	30.083 ¹³⁵	38.35 ²⁰²	25.126 ¹⁷⁰	11.07 ¹³	61.81 ⁴⁸	44.18 ²⁸⁶
Dec. 5.5	17.265 ⁴⁶	45.50 ³⁴⁶	30.182 ⁹⁹	40.44 ²⁰⁹	25.261 ¹³⁵	11.17 ¹⁰	62.15 ³⁴	47.13 ²⁹⁵
15.5	17.242 ²³	48.89 ³³⁹	30.242 ⁶⁰	42.52 ²⁰⁸	25.356 ⁹⁵	11.25 ⁸	62.32 ¹⁷	50.08 ²⁹⁵
25.4	17.150 ⁹²	52.10 ³²¹	30.263 ²¹	44.53 ²⁰¹	25.408 ⁵²	11.31 ⁶	62.32 ⁰	52.94 ²⁸⁶
35.4	16.993 ¹⁵⁷	55.00 ²⁹⁰	30.242 ²¹	46.40 ¹⁸⁷	25.415 ⁷	11.34 ³	62.16 ¹⁶	55.62 ²⁶⁸
Mean Place	13.404	51.39	25.392	48.26	19.291	2.40	46.387	39.06
Sec δ , Tan δ	1.753	-1.440	1.033	-0.258	1.085	+0.420	4.075	+3.951
$D\phi\alpha$, $D_\alpha\alpha$	+0.03	+0.03	+0.05	+0.01	+0.07	-0.01	+0.16	-0.09
$D\phi\delta$, $D_\alpha\delta$	+0.1	+0.9	+0.1	+0.9	+0.1	+0.9	+0.1	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Caeli. Mag. 4.5		4 Camelop. Mag. 5.4		μ Eridani. Mag. 4.2		π^3 Orionis. Mag. 3.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 37	° ' " -42 0	h m 4 41	° ' " +56 36	h m 4 41	° ' " -3 23	h m 4 45	° ' " + 6 49
	s "	"	s "	"	s "	"	s "	"
Jan. 0.4	57.325	77.97	13.924	56.51	26.338	74.25	25.582	10.91
10.4	57.215 ¹¹⁰	80.54 ²⁵⁷	13.863 ⁶¹	58.26 ¹⁷⁵	26.314 ²⁴	75.55 ¹³⁰	25.570 ¹²	10.09 ⁸²
20.4	57.057 ¹⁵⁸	82.73 ²¹⁹	13.729 ¹³⁴	59.76 ¹⁸⁰	26.250 ⁶⁴	76.71 ¹¹⁶	25.516 ⁵⁴	9.36 ⁷³
30.3	56.858 ¹⁹⁹	84.50 ¹⁷⁷	13.530 ¹⁹⁹	60.95 ¹¹⁹	26.152 ⁹⁸	77.68 ⁹⁷	25.426 ⁹⁰	8.71 ⁶⁵
Feb. 9.3	56.626 ²³²	85.81 ¹³¹	13.276 ²⁵⁴	61.78 ⁸³	26.021 ¹³¹	78.48 ⁸⁰	25.302 ¹²⁴	8.16 ⁵⁵
19.3	56.367 ²⁵⁹	86.62 ⁸¹	12.981 ²⁹⁵	62.23 ⁴⁵	25.867 ¹⁵⁴	79.07 ⁸⁹	25.154 ¹⁴⁸	7.70 ⁴⁶
Mar. 1.3	56.093 ²⁷⁴	86.94 ³²	12.660 ³²¹	62.25 ²	25.696 ¹⁷¹	79.47 ⁴⁰	24.988 ¹⁶⁶	7.34 ³⁶
11.2	55.817 ²⁷⁶	86.76 ¹⁸	12.331 ³²⁹	61.86 ³⁹	25.520 ¹⁷⁶	79.65 ¹⁸	24.816 ¹⁷³	7.09 ²⁵
21.2	55.548 ²⁹⁹	86.09 ⁶⁷	12.013 ³¹⁸	61.08 ⁷⁸	25.348 ¹⁷²	79.63 ²	24.648 ¹⁶⁸	6.95 ¹⁴
31.2	55.297 ²⁵¹	84.96 ¹¹³	11.723 ²⁹⁰	59.93 ¹¹⁵	25.191 ¹⁵⁷	79.39 ²⁴	24.493 ¹⁵⁵	6.92 ³
	224	157	246	145	135	44	132	9
Apr. 10.1	55.073 ¹⁸⁷	83.39 ¹⁹⁵	11.477 ¹⁸⁸	58.48 ¹⁷¹	25.056 ¹⁰⁴	78.95 ⁶⁶	24.361 ¹⁰¹	7.01 ²⁴
20.1	54.886 ¹⁴¹	81.44 ²³⁰	11.289 ¹²³	56.77 ¹⁸⁷	24.952 ⁶⁷	78.29 ⁸⁶	24.260 ⁶³	7.25 ³⁸
30.1	54.745 ⁹⁰	79.14 ²⁶²	11.166 ⁴⁷	54.90 ¹⁹⁸	24.885 ²⁵	77.43 ¹⁰⁵	24.197 ²¹	7.63 ⁵³
May 10.1	54.655 ³⁸	76.52 ²⁸⁵	11.119 ²⁹	52.92 ²⁰¹	24.860 ¹⁸	76.38 ¹²⁵	24.176 ²³	8.16 ⁶⁸
20.0	54.617 ¹⁷	73.67 ³⁰³	11.148 ¹⁰⁹	50.91 ¹⁹⁷	24.878 ⁶²	75.13 ¹³⁹	24.199 ⁶⁷	8.84 ⁸²
30.0	54.634 ⁷²	70.64 ³¹³	11.257 ¹⁸⁴	48.94 ¹⁸⁷	24.940 ¹⁰⁶	73.74 ¹⁵³	24.266 ¹¹¹	9.66 ⁹⁵
June 9.0	54.706 ¹²⁵	67.51 ³¹⁵	11.441 ²⁵³	47.07 ¹⁷⁰	25.046 ¹⁴⁸	72.21 ¹⁶⁴	24.377 ¹⁵²	10.61 ¹⁰⁶
19.0	54.831 ¹⁷⁵	64.36 ³⁰⁸	11.694 ³¹⁸	45.37 ¹⁵⁰	25.194 ¹⁸¹	70.57 ¹⁶⁸	24.529 ¹⁸⁷	11.67 ¹¹⁶
28.9	55.006 ²²⁰	61.28 ²⁹⁶	12.012 ³⁷³	43.87 ¹²⁶	25.375 ²¹⁴	68.89 ¹⁶⁹	24.716 ²²¹	12.83 ¹²⁰
July 8.9	55.226 ²⁵⁹	58.32 ²⁷³	12.385 ⁴²⁰	42.61 ⁹⁹	25.589 ²⁴⁰	67.20 ¹⁶⁴	24.937 ²⁴⁶	14.03 ¹²¹
18.9	55.485 ²⁹⁰	55.59 ²⁴¹	12.805 ⁴⁵⁷	41.62 ⁷⁰	25.829 ²⁶¹	65.56 ¹⁵⁵	25.183 ²⁶⁷	15.24 ¹¹⁷
28.8	55.775 ³¹⁷	53.18 ²⁰²	13.262 ⁴⁸⁵	40.92 ⁴²	26.090 ²⁷⁶	64.01 ¹⁴⁰	25.450 ²⁸³	16.41 ¹¹¹
Aug. 7.8	56.092 ³³³	51.16 ¹⁵⁵	13.747 ⁵⁰²	40.50 ¹¹	26.366 ²⁸⁵	62.61 ¹¹⁹	25.732 ²⁹¹	17.52 ¹⁰⁰
17.8	56.425 ³⁴⁴	49.61 ¹⁰⁵	14.249 ⁵¹²	40.39 ¹⁸	26.651 ²⁸⁹	61.42 ⁹⁵	26.023 ²⁹⁵	18.52 ⁸⁴
27.8	56.769 ³⁴⁶	48.55 ⁴⁸	14.761 ⁵¹³	40.57 ⁴⁶	26.940 ²⁹⁹	60.47 ⁶⁶	26.318 ³⁰⁵	19.36 ⁶⁵
Sept. 6.7	57.115 ³⁴¹	48.07 ⁹	15.274 ⁵⁰⁷	41.03 ⁷³	27.229 ²⁸⁴	59.81 ³⁴	26.613 ²⁹¹	20.01 ⁴⁴
16.7	57.456 ³²⁸	48.16 ⁶⁸	15.781 ⁴⁹²	41.76 ⁹⁸	27.513 ²⁷⁵	59.47 ³	26.904 ²⁸²	20.45 ²⁰
26.7	57.784 ³⁰⁸	48.84 ¹²⁵	16.273 ⁴⁷³	42.74 ¹²³	27.788 ²⁶¹	59.44 ³¹	27.186 ²⁷¹	20.65 ²
Oct. 6.7	58.092 ²⁸³	50.09 ¹⁷⁹	16.746 ⁴⁴⁵	43.97 ¹⁴³	28.049 ²⁴⁶	59.75 ⁶¹	27.457 ²⁵⁵	20.63 ²⁶
16.6	58.375 ²⁵¹	51.88 ²²⁶	17.191 ⁴¹¹	45.40 ¹⁶⁴	28.295 ²²⁸	60.36 ⁸⁹	27.712 ²³⁸	20.37 ⁴⁶
26.6	58.626 ²¹³	54.14 ²⁶⁶	17.602 ³⁶⁹	47.04 ¹⁸⁰	28.523 ²⁰⁴	61.25 ¹¹⁴	27.950 ²¹⁵	19.91 ⁶³
Nov. 5.6	58.839 ¹⁷²	56.80 ²⁹⁵	17.971 ³²¹	48.84 ¹⁹³	28.727 ¹⁷⁸	62.39 ¹³²	28.165 ¹⁹¹	19.28 ⁷⁷
15.5	59.011 ¹²⁵	59.75 ³¹⁴	18.292 ²⁶⁵	50.77 ²⁰³	28.905 ¹⁴⁸	63.71 ¹⁴⁴	28.356 ¹⁶¹	18.51 ⁸⁷
25.5	59.136 ⁷⁶	62.89 ³²⁰	18.557 ²⁰¹	52.80 ²⁰⁷	29.053 ¹¹⁶	65.15 ¹⁵²	28.517 ¹²⁸	17.64 ⁹²
Dec. 5.5	59.212 ²⁴	66.09 ³¹⁶	18.758 ¹³¹	54.87 ²⁰⁷	29.169 ⁷⁸	66.65 ¹⁵²	28.645 ⁹²	16.72 ⁹³
15.5	59.236 ²⁹	69.25 ³⁰¹	18.889 ⁵⁷	56.94 ²⁰⁰	29.247 ⁸⁷	68.17 ¹⁴⁷	28.737 ⁵¹	15.79 ⁹¹
25.4	59.207 ⁸¹	72.26 ²⁷⁷	18.946 ¹⁹	58.94 ¹⁸⁷	29.284 ¹	69.64 ¹³⁹	28.788 ¹⁰	14.88 ⁸⁷
35.4	59.126	75.03	18.927	60.81	29.283	71.03	28.798	14.01
Mean Place	55.055	72.37	9.997	46.95	24.090	74.37	23.237	9.19
Sec δ , Tan δ	1.346	-0.901	1.818	+1.517	1.002	-0.059	1.007	+0.120
D δ α , D ω α	+0.04	+0.02	+0.10	-0.03	+0.06	0.00	+0.06	0.00
D δ δ , D ω δ	+0.1	+0.9	+0.1	+0.9	+0.1	+0.9	+0.1	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	9 Camelop. Mag. 4.4		ι Tauri. Mag. 5.1		π ⁵ Orionis. Mag. 3.9		ι Aurigæ. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 45	° ' +66 12	h m 4 46	° ' +18 42	h m 4 49	° ' + 2 18	h m 4 51	° ' +33 2
	s 45	" 12	s 46	" 42	s 49	" 18	s 51	" 2
Jan. 0.4	58.48	28.73	37.027	8.54	61.069	27.67	41.890	20.31
10.4	58.38	30.92	37.017	8.34	61.056	26.61	41.884	20.89
20.4	58.17	32.84	36.965	8.13	61.003	25.67	41.827	21.38
30.3	57.87	34.40	36.871	7.91	60.912	24.85	41.724	21.75
Feb. 9.3	57.51	35.54	36.743	7.68	60.788	24.19	41.581	21.97
19.3	57.09	36.22	36.591	7.44	60.639	23.65	41.406	22.03
Mar. 1.3	56.64	36.41	36.418	7.15	60.471	23.26	41.211	21.91
11.2	56.17	36.11	36.239	6.85	60.297	23.03	41.007	21.60
21.2	55.71	35.32	36.063	6.52	60.126	22.94	40.806	21.14
31.2	55.30	34.09	35.904	6.20	59.968	23.02	40.621	20.52
Apr. 10.2	54.94	32.48	35.768	5.90	59.831	23.26	40.463	19.78
20.1	54.66	30.55	35.663	5.65	59.725	23.66	40.343	18.97
30.1	54.47	28.37	35.601	5.46	59.656	24.24	40.266	18.13
May 10.1	54.37	26.05	35.580	5.36	59.628	25.00	40.238	17.29
20.0	54.37	23.64	35.607	5.37	59.643	25.91	40.263	16.49
30.0	54.49	21.24	35.681	5.51	59.702	26.97	40.340	15.78
June 9.0	54.70	18.92	35.801	5.75	59.805	28.18	40.468	15.17
19.0	55.00	16.75	35.961	6.14	59.947	29.48	40.644	14.69
28.9	55.39	14.79	36.162	6.63	60.127	30.85	40.864	14.35
July 8.9	55.86	13.09	36.394	7.22	60.339	32.25	41.121	14.18
18.9	56.40	11.67	36.654	7.91	60.576	33.64	41.408	14.14
28.9	57.00	10.59	36.936	8.64	60.836	34.98	41.721	14.24
Aug. 7.8	57.63	9.85	37.232	9.37	61.111	36.19	42.052	14.48
17.8	58.29	9.47	37.538	10.09	61.396	37.26	42.394	14.82
27.8	58.97	9.43	37.849	10.76	61.686	38.14	42.743	15.24
Sept. 6.7	59.65	9.76	38.160	11.38	61.976	38.78	43.092	15.74
16.7	60.32	10.43	38.468	11.88	62.263	39.17	43.438	16.28
26.7	60.98	11.42	38.768	12.29	62.543	39.29	43.776	16.86
Oct. 6.7	61.62	12.74	39.055	12.58	62.812	39.12	44.103	17.47
16.6	62.22	14.36	39.325	12.75	63.065	38.70	44.412	18.09
26.6	62.76	16.23	39.579	12.81	63.302	38.03	44.702	18.72
Nov. 5.6	63.25	18.35	39.809	12.78	63.517	37.16	44.968	19.38
15.5	63.68	20.65	40.015	12.67	63.708	36.13	45.206	20.04
25.5	64.03	23.09	40.189	12.51	63.868	34.98	45.407	20.72
Dec. 5.5	64.29	25.61	40.329	12.33	63.996	33.78	45.570	21.41
15.5	64.45	28.15	40.431	12.13	64.088	32.56	45.689	22.09
25.4	64.50	30.62	40.490	11.93	64.139	31.39	45.760	22.75
35.4	64.46	32.94	40.505	11.71	64.149	30.27	45.780	23.37
Mean Place	53.387	18.65	34.518	4.89	58.753	26.85	39.060	14.77
Sec δ, Tan δ	2.479	+2.268	1.056	+0.339	1.001	+0.040	1.193	+0.650
D _ψ α, D _ω α	+0.12	-0.05	+0.07	-0.01	+0.06	0.00	+0.08	-0.01
D _ψ δ, D _ω δ	+0.1	+0.9	+0.1	+0.9	+0.1	+1.0	+0.1	+1.0

APPARENT PLACES OF STARS, 1918.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Aurigæ. Var. 3.0-4.5		β Camelop. Mag. 4.2		ζ Aurigæ. Mag. 3.9		ι Tauri. Mag. 4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 56	° ' +43 42	h m 4 56	° ' +60 19	h m 4 56	° ' +40 57	h m 4 58	° ' +21 28
	s "	"	s "	"	s "	"	s "	"
Jan. 0.4	8.140	18.26	11.37	35.10	47.701	33.10	14.182	29.14
10.4	8.131 ⁹	19.41 ¹¹⁵	11.32 ⁵	37.08 ¹⁹⁸	47.693 ⁸	34.12 ¹⁰²	14.183 ¹	29.09 ⁵
20.4	8.061 ⁷⁰	20.43 ¹⁰²	11.19 ¹³	38.83 ¹⁷⁵	47.630 ⁶³	35.00 ⁸⁸	14.139 ⁴⁴	29.03 ⁶
30.3	7.938 ¹²³	21.25 ⁸²	10.98 ²¹	40.28 ¹⁴⁵	47.515 ¹¹⁵	35.71 ⁷¹	14.053 ⁸⁶	28.95 ⁸
Feb. 9.3	7.768 ¹⁷⁰	21.83 ⁵⁸	10.70 ²⁸	41.36 ¹⁰⁸	47.356 ¹⁵⁰	36.22 ⁵¹	13.929 ¹²⁴	28.84 ¹¹
	207	31	32	68	192	26	154	16
19.3	7.561	22.14	10.38	42.04	47.164	36.48	13.775	28.68
Mar. 1.3	7.330 ²³¹	22.18 ⁴	10.01 ³⁷	42.28 ²⁴	46.946 ²¹⁸	36.49 ¹	13.602 ¹⁷³	28.45 ²³
11.2	7.088 ²⁴²	21.92 ²⁶	9.64 ³⁷	42.08 ²⁰	46.716 ²³⁰	36.23 ²⁶	13.419 ¹⁸³	28.19 ²⁶
21.2	6.850 ²³⁸	21.40 ⁵²	9.27 ³⁷	41.44 ⁶⁴	46.489 ²¹⁷	35.73 ⁵⁰	13.238 ¹⁸¹	27.88 ³¹
31.2	6.630 ²²⁰	20.61 ⁷⁹	8.94 ³³	40.40 ¹⁰⁴	46.276 ¹⁰³	35.00 ⁷³	13.070 ¹⁶⁸	27.54 ³⁴
	191	100	29	139	181	91	146	36
Apr. 10.2	6.439	19.61	8.65	39.01	46.095	34.09	12.924	27.18
20.1	6.291 ¹⁴⁸	18.42 ¹¹⁹	8.41 ²⁴	37.31 ¹⁷⁰	45.952 ¹⁴³	33.01 ¹⁰⁸	12.812 ¹¹²	26.83 ³⁵
30.1	6.192 ⁹⁹	17.13 ¹²⁹	8.25 ¹⁶	35.39 ¹⁹²	45.859 ⁹³	31.82 ¹¹⁹	12.738 ⁷⁴	26.53 ³⁰
May 10.1	6.151 ⁴¹	15.78 ¹³⁵	8.16 ⁹	33.31 ²⁰⁸	45.819 ⁴⁰	30.60 ¹²²	12.708 ³⁰	26.29 ²⁴
20.0	6.168 ¹⁷	14.42 ¹³⁶	8.16 ⁰	31.16 ²¹⁵	45.836 ¹⁷	29.38 ¹²²	12.725 ¹⁷	26.13 ¹⁶
	77	132	9	215	75	116	64	6
30.0	6.245	13.10	8.25	29.01	45.911	28.22	12.789	26.07
June 9.0	6.381 ¹³⁶	11.87 ¹²³	8.41 ¹⁶	26.93 ²⁰⁸	46.043 ¹³²	27.14 ¹⁰⁸	12.900 ¹¹¹	26.13 ⁶
19.0	6.573 ¹⁹²	10.77 ¹¹⁰	8.66 ²⁵	24.97 ¹⁹⁶	46.227 ¹⁸⁴	26.18 ⁹⁶	13.054 ¹⁵⁴	26.30 ¹⁷
28.9	6.815 ²⁴²	9.83 ⁹⁴	8.98 ³²	23.19 ¹⁷⁸	46.460 ²³³	25.38 ⁸⁰	13.247 ¹⁹³	26.59 ²⁹
July 8.9	7.099 ²⁸⁴	9.07 ⁷⁶	9.36 ³⁸	21.65 ¹⁵⁴	46.735 ²⁷⁵	24.76 ⁶²	13.475 ²²⁸	26.98 ³⁹
	323	57	44	128	311	45	257	47
18.9	7.422	8.50	9.80	20.37	47.046	24.31	13.732	27.45
28.9	7.774 ³⁵²	8.13 ³⁷	10.28 ⁴⁸	19.35 ¹⁰²	47.384 ³³⁸	24.05 ²⁶	14.012 ²⁸⁰	27.99 ⁵⁴
Aug. 7.8	8.148 ³⁷⁴	7.96 ¹⁷	10.80 ⁵²	18.65 ⁷⁰	47.745 ³⁶¹	23.96 ⁹	14.308 ²⁹⁶	28.56 ⁵⁷
17.8	8.536 ³⁸⁸	7.97 ¹	11.34 ⁵⁴	18.24 ⁴¹	48.119 ³⁷⁴	24.05 ⁹	14.617 ³⁰⁹	29.14 ⁵⁸
27.8	8.935 ³⁹⁹	8.18 ²¹	11.90 ⁵⁶	18.16 ⁸	48.501 ³⁸²	24.30 ²⁵	14.931 ³¹⁴	29.71 ⁵⁷
	401	36	57	22	385	38	317	51
Sept. 6.7	9.336	8.54	12.47	18.38	48.886	24.68	15.248	30.22
16.7	9.732 ³⁹⁶	9.06 ⁵²	13.03 ⁵⁶	18.90 ⁵²	49.268 ³⁸²	25.18 ⁵⁰	15.562 ³¹⁴	30.67 ⁴⁵
26.7	10.122 ³⁹⁰	9.73 ⁶⁷	13.58 ⁵⁵	19.72 ⁸²	49.643 ³⁷⁵	25.81 ⁶³	15.868 ³⁰⁶	31.03 ³⁶
Oct. 6.7	10.499 ³⁷⁷	10.52 ⁷⁹	14.12 ⁵⁴	20.81 ¹⁰⁹	50.005 ³⁶²	26.55 ⁷⁴	16.165 ²⁹⁷	31.31 ²⁸
16.6	10.857 ³⁵⁸	11.43 ⁹¹	14.63 ⁵¹	22.15 ¹³⁴	50.349 ³⁴⁴	27.37 ⁸²	16.449 ²⁸⁴	31.50 ¹⁹
	337	102	47	159	324	91	267	11
26.6	11.194	12.45	15.10	23.74	50.673	28.28	16.716	31.61
Nov. 5.6	11.503 ³⁰⁹	13.56 ¹¹¹	15.53 ⁴³	25.53 ¹⁷⁹	50.970 ²⁹⁷	29.26 ⁹⁸	16.961 ²⁴⁵	31.65 ⁴
15.6	11.777 ²⁷⁴	14.77 ¹²¹	15.91 ³⁸	27.60 ¹⁹⁷	51.234 ²⁶⁴	30.31 ¹⁰⁵	17.180 ²¹⁹	31.64 ¹
25.5	12.012 ²³⁵	16.03 ¹²⁶	16.22 ³¹	29.62 ²¹²	51.460 ²²⁶	31.41 ¹¹⁰	17.371 ¹⁹¹	31.60 ⁴
Dec. 5.5	12.200 ¹⁸⁸	17.34 ¹³¹	16.46 ²⁴	31.82 ²²⁰	51.643 ¹⁸³	32.55 ¹¹⁴	17.526 ¹⁵⁵	31.54 ⁶
	135	132	17	223	133	115	115	6
15.5	12.335	18.66	16.63	34.05	51.776	33.70	17.641	31.48
25.4	12.415 ⁸⁰	19.95 ¹²⁹	16.71 ⁸	36.25 ²²⁰	51.856 ⁸⁰	34.83 ¹¹³	17.713 ⁷²	31.42 ⁶
35.4	12.436 ²¹	21.16 ¹²¹	16.71 ⁰	38.33 ²⁰⁸	51.883 ²⁷	35.90 ¹⁰⁷	17.740 ²⁷	31.37 ⁵
Mean Place	4.922	11.62	7.002	26.60	44.592	26.88	11.591	25.73
Sec δ , Tan δ	1.383	+0.956	2.020	+1.755	1.324	+0.868	1.075	+0.993
$D\psi\alpha$, $D\omega\alpha$	+0.09	-0.02	+0.11	-0.03	+0.08	-0.02	+0.07	-0.01
$D\psi\delta$, $D\omega\delta$	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington a Time.	11 Orionis. Mag. 4.6		7 Aurigæ. Mag. 3.3		8 Leporis. Mag. 3.3		β Eridani. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 59	° ' " +15 17	h m 5 0	° ' " +41 7	h m 5 1	° ' " -22 28	h m 5 3	° ' " - 5 11
	s 45.422	" 29.87	s 48.862	" 35.29	s 61.591	" 52.20	s 51.392	" 29.91
i. 0.4	55.422 2	29.87 40	48.862 4	35.29 104	61.591 33	52.20 219	51.392 8	29.91 147
10.4	55.424 42	29.47 36	48.858 60	36.33 91	61.558 77	54.39 195	51.384 49	31.38 131
20.4	55.382 83	29.11 33	48.798 112	37.24 73	61.481 116	56.34 163	51.335 80	32.69 111
30.4	55.299 119	28.78 30	48.686 158	37.97 54	61.365 151	57.97 130	51.246 123	33.80 91
b. 9.3	55.180 147	28.48 29	48.528 194	38.51 29	61.214 178	59.27 95	51.123 160	34.71 60
19.3	55.033 168	28.19 27	48.394 219	38.80 4	61.036 196	60.22 56	50.973 170	35.40 48
r. 1.3	54.865 176	27.92 26	48.115 231	38.84 22	60.840 205	60.78 19	50.803 179	35.88 24
11.2	54.689 176	27.66 24	47.884 229	38.62 47	60.635 204	60.97 18	50.624 179	36.12 2
21.2	54.513 163	27.42 20	47.655 212	38.15 71	60.431 193	60.79 55	50.445 167	36.14 21
31.2	54.350 142	27.22 16	47.443 185	37.44 90	60.238 172	60.24 89	50.278 148	35.93 43
r. 10.2	54.208 112	27.06 10	47.258 145	36.54 106	60.066 143	59.35 123	50.130 119	35.50 66
20.1	54.096 74	26.96 3	47.113 98	35.48 118	59.923 107	58.12 154	50.011 85	34.84 86
30.1	54.022 31	26.93 7	47.015 43	34.30 122	59.816 65	56.58 181	49.926 46	33.98 107
y 10.1	53.991 59	27.00 30	46.972 70	33.08 118	59.751 22	54.77 206	49.880 41	32.91 127
20.1	54.004 103	27.19 41	46.985 127	31.86 110	59.729 69	52.71 239	49.877 83	31.64 156
30.0	54.063 146	27.49 53	47.055 181	30.68 98	59.753 113	50.46 247	49.918 124	30.22 166
ne 9.0	54.166 183	27.90 63	47.182 229	29.58 83	59.822 154	48.07 249	50.001 162	28.66 171
19.0	54.312 218	28.43 71	47.363 271	28.60 66	59.935 189	45.60 244	50.125 194	27.00 172
28.9	54.495 246	29.06 76	47.592 308	27.77 50	60.089 222	43.11 232	50.287 224	25.29 167
ly 8.9	54.713 268	29.77 78	47.863 336	27.11 30	60.278 248	40.67 211	50.481 246	23.57 157
18.9	54.959 284	30.53 78	48.171 359	26.81 14	60.500 268	38.35 186	50.706 265	21.90 142
28.9	55.227 296	31.31 72	48.507 373	26.31 3	60.748 282	36.24 152	50.951 276	20.33 119
g. 7.8	55.511 303	32.09 66	48.866 382	26.17 20	61.016 293	34.38 113	51.216 284	18.91 95
17.8	55.807 304	32.81 55	49.239 385	26.20 33	61.298 297	32.86 69	51.492 287	17.72 65
27.8	56.110 302	33.47 42	49.621 384	26.40 46	61.591 296	31.73 23	51.776 286	16.77 32
pt. 6.8	56.414 296	34.02 27	50.006 377	26.73 57	61.888 290	31.04 26	52.063 281	16.12 2
16.7	56.716 287	34.44 12	50.390 365	27.19 70	62.184 279	30.81 73	52.349 271	15.80 37
26.7	57.012 274	34.71 2	50.767 348	27.76 87	62.474 264	31.07 120	52.630 258	15.82 70
t. 6.7	57.299 256	34.83 15	51.132 329	28.46 244	62.753 244	31.80 161	52.901 242	16.19 90
16.6	57.573 237	34.81 28	51.480 302	29.24 96	63.017 220	33.00 195	53.159 221	16.89 126
26.6	57.829 211	34.66 36	51.809 270	30.11 103	63.261 192	34.61 225	53.401 198	17.88 145
v. 5.6	58.066 183	34.38 42	52.111 234	31.07 109	63.481 159	36.56 243	53.622 168	19.14 161
15.6	58.277 149	34.02 46	52.381 188	32.10 115	63.673 80	38.81 256	53.820 98	20.59 160
25.5	58.460 112	33.60 45	52.615 138	33.19 44	63.832 37	41.24 249	53.988 16	22.20 155
c. 5.5	58.609 70	33.15 42	52.803 85	34.32 108	63.953 8	43.78 232	54.124 16	23.87 155
15.5	58.721 26	32.69 44	52.941 29	35.47 114	64.033 37	46.34 249	54.222 57	25.56 164
25.5	58.791 26	32.25 42	53.028 29	36.61 108	64.070 8	48.83 232	54.279 16	27.20 155
35.4	58.817 26	31.83 42	53.055 29	37.69 108	64.062 8	51.15 232	54.295 16	28.75 155
Place	52.930	27.47	45.730	29.38	59.350	49.27	49.097	29.23
tan δ	1.037	+0.273	1.328	+0.873	1.082	-0.414	1.004	-0.091
D _α	+0.07	0.00	+0.08	-0.02	+0.05	+0.01	+0.06	0.00
D _δ	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Aurigæ. Mag. 4.8			19 H. Camelop. Mag. 5.2			μ Leporis. Mag. 3.3			β Orionis. (Rigel.) Mag. 0.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m s	° ' "	° ' "	h m s	° ' "	° ' "	h m s	° ' "	° ' "	h m s	° ' "	° ' "
Jan. 0.4	51.896	8	23.95	11.21	32.30	17.115	68.29	38.067	44.79	38.067	44.79	46.42
10.4	51.904	8	24.85	10.99	35.09	17.100	70.29	38.061	46.42	38.061	46.42	47.89
20.4	51.854	50	25.65	10.54	37.61	17.040	72.06	38.015	47.89	38.015	47.89	49.13
30.4	51.754	100	26.30	9.91	39.77	16.941	73.56	37.927	49.13	37.927	49.13	50.15
Feb. 9.3	51.609	145	26.79	9.10	41.48	16.807	74.77	37.803	50.15	37.803	50.15	51.47
19.3	51.427	182	27.07	8.16	42.68	16.644	75.68	37.653	51.47	37.653	51.47	52.81
Mar. 1.3	51.218	209	27.13	7.14	43.33	16.462	76.26	37.481	52.81	37.481	52.81	54.15
11.2	50.998	220	26.95	6.08	43.40	16.269	76.51	37.299	54.15	37.299	54.15	55.49
21.2	50.778	220	26.56	5.03	42.88	16.076	76.44	37.117	55.49	37.117	55.49	56.83
31.2	50.572	206	25.96	4.04	41.82	15.893	76.05	36.944	56.83	36.944	56.83	58.17
Apr. 10.2	50.390	182	25.16	3.15	40.26	15.730	75.34	36.790	58.17	36.790	58.17	59.51
20.1	50.246	144	24.24	2.39	38.27	15.593	74.34	36.664	59.51	36.664	59.51	60.85
30.1	50.147	99	23.22	1.81	35.93	15.492	73.06	36.571	60.85	36.571	60.85	62.19
May 10.1	50.100	47	22.14	1.42	33.31	15.430	71.52	36.518	62.19	36.518	62.19	63.53
20.1	50.106	6	21.06	1.23	30.53	15.410	69.77	36.507	63.53	36.507	63.53	64.87
30.0	50.167	61	20.02	1.26	27.66	15.435	67.82	36.539	64.87	36.539	64.87	66.21
June 9.0	50.282	115	19.06	1.49	24.80	15.504	65.72	36.613	66.21	36.613	66.21	67.55
19.0	50.449	167	18.21	1.94	22.02	15.614	63.54	36.729	67.55	36.729	67.55	68.89
28.9	50.664	215	17.50	2.58	19.42	15.764	61.32	36.883	68.89	36.883	68.89	70.23
July 8.9	50.920	256	16.92	3.39	17.05	15.949	59.13	37.070	70.23	37.070	70.23	71.57
18.9	51.211	291	16.50	4.36	14.95	16.165	57.03	37.287	71.57	37.287	71.57	72.91
28.9	51.529	318	16.25	5.46	13.20	16.405	55.08	37.527	72.91	37.527	72.91	74.25
Aug. 7.8	51.871	342	16.14	6.68	11.80	16.667	53.37	37.788	74.25	37.788	74.25	75.59
17.8	52.229	358	16.18	7.98	10.81	16.943	51.93	38.062	75.59	38.062	75.59	76.93
27.8	52.595	366	16.34	9.34	10.23	17.229	50.84	38.344	76.93	38.344	76.93	78.27
37.1		371										
Sept. 6.8	52.966	370	16.63	10.74	10.08	17.519	50.14	38.630	78.27	38.630	78.27	79.61
16.7	53.336	370	17.01	12.14	10.35	17.809	49.85	38.917	79.61	38.917	79.61	80.95
26.7	53.700	364	17.48	13.53	11.05	18.095	50.00	39.199	80.95	39.199	80.95	82.29
Oct. 6.7	54.055	355	18.04	14.89	12.16	18.371	50.59	39.473	82.29	39.473	82.29	83.63
16.6	54.396	341	18.67	16.16	13.67	18.633	51.60	39.734	83.63	39.734	83.63	84.97
26.6	54.719	323	19.38	17.36	15.55	18.880	52.99	39.981	84.97	39.981	84.97	86.31
Nov. 5.6	55.016	297	20.15	18.43	17.78	19.105	54.71	40.207	86.31	40.207	86.31	87.65
15.6	55.284	268	20.99	19.35	20.30	19.302	56.69	40.408	87.65	40.408	87.65	88.99
25.5	55.518	234	21.88	20.12	23.05	19.469	58.87	40.581	88.99	40.581	88.99	90.33
Dec. 5.5	55.709	191	22.82	20.69	25.97	19.601	61.13	40.721	90.33	40.721	90.33	91.67
15.5	55.853	144	23.78	21.04	28.98	19.696	63.42	40.823	91.67	40.823	91.67	93.01
25.5	55.944	91	24.75	21.18	31.99	19.748	65.66	40.884	93.01	40.884	93.01	94.35
35.4	55.982	38	25.68	21.08	34.89	19.756	67.76	40.903	94.35	40.903	94.35	95.69
Mean Place	48.843		18.95	1.021	23.81	14.855	66.09	35.774	95.69	35.774	95.69	97.03
Sec δ , Tan δ	1.276		+0.792	5.307	+5.212	1.042	-0.292	1.011	97.03	1.011	97.03	98.37
$D\alpha$, $D\alpha$	+0.08		-0.01	+0.20	-0.08	+0.05	0.00	+0.06	98.37	+0.06	98.37	99.71
$D\delta$, $D\delta$	+0.1		+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	99.71	+0.1	99.71	101.05

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Aurigæ. (Capella.) Mag. 0.2		λ Aurigæ. Mag. 4.8		τ Orionis. Mag. 3.7		σ Columbæ. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 10	° ' " +45 54	h m 5 13	° ' " +40 1	h m 5 13	° ' " - 6 55	h m 5 14	° ' " -34 58
Jan. 0.4	41.113	63.15	25.368	43.74	39.769	56.57	33.762	33.89
10.4	41.117	64.45	25.382	44.71	39.769	58.15	33.713	36.58
20.4	41.059	65.61	25.339	45.59	39.725	59.57	33.616	38.99
30.4	40.943	66.59	25.241	46.32	39.641	60.78	33.474	41.02
Feb. 9.3	40.775	67.34	25.096	46.89	39.521	61.78	33.293	42.64
19.3	40.566	67.82	24.914	47.24	39.372	62.53	33.080	43.84
Mar. 1.3	40.329	68.00	24.703	47.35	39.202	63.05	32.846	44.58
11.3	40.077	67.88	24.479	47.21	39.023	63.32	32.600	44.85
21.2	39.825	67.46	24.254	46.84	38.842	63.35	32.355	44.67
31.2	39.587	66.74	24.042	46.23	38.670	63.13	32.119	44.05
Apr. 10.2	39.378	65.79	23.854	45.43	38.516	62.69	31.905	43.00
20.1	39.210	64.61	23.703	44.47	38.390	62.00	31.719	41.55
30.1	39.091	63.29	23.596	43.39	38.296	61.10	31.570	39.73
May 10.1	39.028	61.87	23.540	42.24	38.241	59.97	31.464	37.60
20.1	39.026	60.40	23.541	41.07	38.228	58.67	31.406	35.19
30.0	39.086	58.95	23.597	39.92	38.258	57.19	31.396	32.54
June 9.0	39.206	57.55	23.709	38.83	38.331	55.56	31.437	29.74
19.0	39.384	56.26	23.873	37.85	38.445	53.85	31.526	26.86
29.0	39.615	55.11	24.086	36.99	38.598	52.07	31.659	23.97
July 8.9	39.893	54.12	24.343	36.29	38.783	50.30	31.837	21.14
18.9	40.212	53.31	24.636	35.73	38.999	48.58	32.053	18.46
28.9	40.563	52.70	24.958	35.33	39.238	46.95	32.303	16.02
Aug. 7.8	40.940	52.28	25.305	35.10	39.497	45.49	32.578	13.89
17.8	41.337	52.07	25.668	35.01	39.769	44.26	32.875	12.15
27.8	41.744	52.04	26.042	35.07	40.051	43.28	33.186	10.87
Sept. 6.8	42.158	52.20	26.422	35.27	40.337	42.63	33.505	10.10
16.7	42.572	52.53	26.802	35.57	40.623	42.31	33.826	9.86
26.7	42.980	53.02	27.177	35.98	40.906	42.35	34.143	10.19
Oct. 6.7	43.378	53.68	27.544	36.49	41.181	42.75	34.450	11.08
16.6	43.761	54.48	27.896	37.10	41.443	43.50	34.741	12.53
26.6	44.121	55.41	28.230	37.80	41.691	44.57	35.010	14.45
Nov. 5.6	44.456	56.47	28.540	38.58	41.920	45.90	35.251	16.79
15.6	44.757	57.66	28.822	39.44	42.124	47.47	35.459	19.47
25.5	45.017	58.94	29.066	40.37	42.299	49.18	35.629	22.39
Dec. 5.5	45.231	60.29	29.269	41.36	42.443	50.98	35.757	25.46
15.5	45.391	61.69	29.424	42.39	42.549	52.80	35.837	28.55
25.5	45.491	63.09	29.525	43.43	42.614	54.57	35.868	31.56
35.4	45.529	64.44	29.569	44.44	42.637	56.24	35.849	34.41
Mean Place	37.735	57.53	22.239	39.01	37.464	55.45	31.451	29.75
Sec δ , Tan δ	1.437	+1.033	1.306	+0.840	1.007	-0.121	1.221	-0.700
$D\phi\alpha$, $D\omega\alpha$	+0.09	-0.01	+0.08	-0.01	+0.06	0.00	+0.04	+0.01
$D\phi\delta$, $D\omega\delta$	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Orionis. (Bellatrix) Mag. 1.7		β Tauri. Mag. 1.8		17 Camelop. Mag. 5.8		β Leporis. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 20	° ' " + 6 16	h m 5 21	° ' " +28 32	h m 5 22	° ' " +62 59	h m 5 24	° ' " -20 49
	s	"	s	"	s	"	s	"
Jan. 0.4	46.355	35.23	9.226	24.57	30.14	67.50	46.197	28.94
10.4	46.371 ¹⁶	34.31 ⁹²	9.250 ²⁴	24.91 ³⁴	30.13 ¹	69.68 ²¹⁸	46.188 ⁹	31.21 ²²⁷
20.4	46.342 ²⁹	33.48 ⁸³	9.223 ²⁷	25.23 ³²	30.02 ¹¹	71.69 ²⁰¹	46.133 ⁵⁵	33.23 ²⁰²
30.4	46.272 ⁷⁰	32.78 ⁶⁰	9.148 ⁷⁵	25.51 ²⁸	29.83 ¹⁹	73.43 ¹⁷⁴	46.037 ⁹⁶	34.97 ¹⁷⁴
Feb. 9.3	46.164 ¹⁰⁸	32.18 ⁷⁰	9.030 ¹¹⁸	25.70 ¹⁹	29.56 ²⁷	74.84 ¹⁴¹	45.902 ¹³⁵	36.40 ¹⁴³
	138	48	154	10	34	102	167	108
19.3	46.026	31.70	8.876	25.80	29.22	75.86	45.735	37.48
Mar. 1.3	45.864 ¹⁶²	31.33 ³⁷	8.697 ¹⁷⁹	25.79 ¹	28.84 ³⁸	76.44 ⁵⁸	45.548 ¹⁸⁷	38.20 ⁷²
11.3	45.690 ¹⁷⁴	31.09 ²⁴	8.504 ¹⁹³	25.66 ¹³	28.43 ⁴¹	76.57 ¹³	45.347 ²⁰¹	38.55 ³⁵
21.2	45.514 ¹⁷⁶	30.95 ¹⁴	8.308 ¹⁹⁶	25.40 ²⁶	28.02 ⁴¹	76.23 ³⁴	45.143 ²⁰⁴	38.56 ¹
31.2	45.347 ¹⁶⁷	30.92 ³	8.121 ¹⁸⁷	25.03 ³⁷	27.62 ⁴⁰	75.45 ⁷⁸	44.947 ¹⁹⁶	38.20 ³⁶
	150	10	166	46	35	118	179	71
Apr. 10.2	45.197	31.02	7.955	24.57	27.27	74.27	44.768	37.49
20.1	45.074 ¹²³	31.25 ²³	7.819 ¹³⁶	24.03 ⁵⁴	26.97 ³⁰	72.73 ¹⁵⁴	44.615 ¹⁵³	36.45 ¹⁰⁴
30.1	44.984 ⁹⁰	31.61 ³⁶	7.722 ⁹⁷	23.46 ⁵⁷	26.74 ²³	70.91 ¹⁸²	44.495 ¹²⁰	35.11 ¹³⁴
May 10.1	44.933 ⁵¹	32.10 ⁴⁹	7.670 ⁵²	22.88 ⁵⁸	26.60 ¹⁴	68.85 ²⁰⁶	44.413 ⁸²	33.48 ¹⁶³
20.1	44.924 ⁹	32.74 ⁶⁴	7.665 ⁵	22.33 ⁵⁵	26.55 ⁵	66.67 ²¹⁸	44.374 ³⁹	31.62 ¹⁸⁶
	35	77	44	49	3	226	3	208
30.0	44.959	33.51	7.709	21.84	26.58	64.41	44.377	29.54
June 9.0	45.036 ⁷⁷	34.39 ⁸⁸	7.802 ⁹³	21.42 ⁴²	26.69 ¹¹	62.15 ²²⁶	44.426 ⁴⁹	27.31 ²²³
19.0	45.155 ¹¹⁹	35.37 ⁹⁸	7.942 ¹⁴⁰	21.09 ³³	26.90 ²¹	59.97 ²¹⁸	44.518 ⁹²	24.97 ²³⁴
29.0	45.311 ¹⁵⁶	36.43 ¹⁰⁶	8.124 ¹⁸²	20.87 ²²	27.20 ³⁰	57.92 ²⁰⁵	44.651 ¹³³	22.59 ²³⁸
July 8.9	45.501 ¹⁹⁰	37.52 ¹⁰⁹	8.344 ²²⁰	20.75 ¹²	27.56 ³⁶	56.03 ¹⁸⁹	44.822 ¹⁷¹	20.23 ²³⁶
	220	111	263	3	43	165	203	226
18.9	45.721	38.63	8.597	20.72	27.99	54.38	45.025	17.97
28.9	45.963 ²⁴²	39.71 ¹⁰⁸	8.876 ²⁷⁹	20.79 ⁷	28.49 ⁵⁰	52.97 ¹⁴¹	45.255 ²³⁰	15.88 ²⁰⁹
Aug. 7.8	46.226 ²⁶³	40.71 ¹⁰⁰	9.177 ³⁰¹	20.94 ¹⁵	29.02 ⁵³	51.86 ¹¹¹	45.509 ²⁵⁴	14.02 ¹⁸⁶
17.8	46.503 ²⁷⁷	41.59 ⁸⁸	9.493 ³¹⁶	21.14 ²⁰	29.58 ⁵⁶	51.04 ⁸²	45.780 ²⁷¹	12.47 ¹⁵⁵
27.8	46.788 ²⁸⁵	42.30 ⁷¹	9.819 ³²⁶	21.39 ²⁵	30.17 ⁵⁹	50.52 ⁵²	46.064 ²⁸⁴	11.29 ¹¹⁸
	290	54	332	26	61	19	291	78
Sept. 6.8	47.078	42.84	10.151	21.65	30.78	50.33	46.355	10.51
16.7	47.370 ²⁹²	43.15 ³¹	10.484 ³³³	21.91 ²⁶	31.40 ⁶²	50.46 ¹³	46.650 ²⁹⁵	10.19 ³²
26.7	47.659 ²⁸⁹	43.23 ⁸	10.814 ³³⁰	22.17 ²⁶	32.01 ⁶¹	50.89 ⁴³	46.942 ²⁹²	10.34 ¹⁵
Oct. 6.7	47.943 ²⁸⁴	43.06 ¹⁷	11.138 ³²⁴	22.41 ²⁴	32.60 ⁵⁹	51.65 ⁷⁶	47.228 ²⁸⁶	10.97 ⁶³
16.7	48.216 ²⁷³	42.68 ³⁸	11.451 ³¹³	22.63 ²²	33.18 ⁵⁸	52.70 ¹⁰⁵	47.502 ²⁷⁴	12.05 ¹⁰⁸
	259	60	298	22	55	132	258	150
26.6	48.475	42.08	11.749	22.85	33.73	54.02	47.760	13.55
Nov. 5.6	48.718 ²⁴³	41.29 ⁷⁹	12.028 ²⁷⁹	23.07 ²²	34.23 ⁵⁰	55.61 ¹⁵⁹	47.998 ²³⁸	15.42 ¹⁸⁷
15.6	48.937 ²¹⁹	40.37 ⁹²	12.282 ²⁵⁴	23.31 ²⁴	34.67 ⁴⁴	57.44 ¹⁸³	48.209 ²¹¹	17.60 ²¹⁸
25.5	49.130 ¹⁹³	39.35 ¹⁰²	12.506 ²²⁴	23.56 ²⁵	35.06 ³⁹	59.48 ²⁰⁴	48.390 ¹⁸¹	19.98 ²³⁸
Dec. 5.5	49.291 ¹⁶¹	38.28 ¹⁰⁷	12.695 ¹⁸⁹	23.84 ²⁸	35.38 ³²	61.67 ³⁹	48.535 ¹⁴⁵	22.49 ²⁵¹
	124	107	147	31	23	228	106	255
15.5	49.415	37.21	12.842	24.15	35.61	63.95	48.641	25.04
25.5	49.498 ⁸³	36.16 ¹⁰⁵	12.943 ¹⁰¹	24.48 ³³	35.75 ¹⁴	66.25 ²³⁰	48.703 ⁶²	27.55 ²⁵¹
35.4	49.538 ⁴⁰	35.18 ⁹⁸	12.995 ⁵²	24.82 ³⁴	35.79 ⁴	68.51 ²²⁶	48.719 ¹⁶	29.93 ²³⁸
Mean Place	43.928	34.97	6.427	21.73	25.304	61.48	43.910	26.20
Sec δ , Tan δ	1.006	+0.110	1.138	+0.544	2.203	+1.963	1.070	-0.380
$D\psi a$, $D\omega a$	+0.06	0.00	+0.08	-0.01	+0.11	-0.02	+0.05	0.00
$D\psi \delta$, $D\omega \delta$	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	χ Aurigæ. Mag. 4.9		δ Orionis. Mag. 2.5		Groombridge 966. Mag. 6.4		α Leporis. Mag. 2.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 27	° ' " +32 7	h m 5 27	° ' " - 0 21	h m 5 28	° ' " +74 59	h m 5 29	° ' " -17 52
	s	"	s	"	s	"	s	"
a. 0.5	26.285	59.93	51.380	32.61	52.93	37.26	9.101	51.04
10.4	26.314 ²⁹	60.49 ⁵⁶	51.398 ¹⁸	33.91 ¹³⁰	52.86 ⁷	39.96 ²⁷⁰	9.100 ¹	53.20 ²¹⁶
20.4	26.290 ²⁴	61.02 ⁵³	51.371 ²⁷	35.07 ¹¹⁶	52.63 ²³	42.45 ²⁴⁹	9.054 ⁴⁶	55.14 ¹⁹⁴
30.4	26.215 ⁷⁵	61.48 ⁴⁶	51.301 ⁷⁰	36.08 ¹⁰¹	52.24 ³⁹	44.64 ²¹⁹	8.965 ⁸⁹	56.80 ¹⁶⁶
b. 9.3	26.096 ¹¹⁹	61.83 ³⁵	51.194 ¹⁰⁷	36.91 ⁸³	51.72 ⁵²	46.45 ¹⁸¹	8.838 ¹²⁷	58.19 ¹³⁹
19.3	25.939 ¹⁵⁷	62.07 ²⁴	51.057 ¹³⁷	37.56 ⁶⁵	51.09 ⁶³	47.80 ¹³⁵	8.679 ¹⁵⁹	59.24 ¹⁰⁵
c. 1.3	25.754 ¹⁸⁵	62.17 ¹⁰	50.895 ¹⁶²	38.04 ⁴⁸	50.39 ⁷⁰	48.64 ⁸⁴	8.498 ¹⁸¹	59.95 ⁷¹
11.3	25.553 ²⁰¹	62.08 ⁹	50.720 ¹⁷⁵	38.32 ²⁸	49.64 ⁷⁵	48.94 ³⁰	8.303 ¹⁹⁵	60.33 ³⁸
21.2	25.349 ²⁰⁴	61.87 ²¹	50.542 ¹⁷⁸	38.43 ¹¹	48.88 ⁷⁶	48.69 ²⁵	8.105 ¹⁹⁸	60.38 ⁵
31.2	25.153 ¹⁹⁶	61.48 ³⁹	50.370 ¹⁷²	38.37 ⁶	48.15 ⁷³	47.90 ⁷⁹	7.913 ¹⁹²	60.08 ³⁰
17.4	25.153 ¹⁷⁴	61.48 ⁵¹	50.370 ¹⁵⁴	38.37 ²⁶	48.15 ⁶⁷	47.90 ¹²⁸	7.913 ¹⁷⁴	60.08 ⁶³
d. 10.2	24.979 ¹⁴⁷	60.97 ⁶⁰	50.216 ¹²⁹	38.11 ⁴³	47.48 ⁵⁸	46.62 ¹⁷³	7.739 ¹⁵⁰	59.45 ⁹²
20.2	24.832 ¹⁰⁶	60.37 ⁶⁹	50.087 ⁹⁸	37.68 ⁶¹	46.90 ⁴⁵	44.89 ²¹⁰	7.589 ¹¹⁷	58.53 ¹²³
30.1	24.726 ⁶¹	59.68 ⁷⁴	49.989 ⁵⁹	37.07 ⁷⁹	46.45 ³³	42.79 ²³⁸	7.472 ⁸⁰	57.30 ¹⁴⁹
e. 10.1	24.665 ¹¹	58.94 ⁷²	49.930 ¹⁹	36.28 ⁹⁴	46.12 ¹⁸	40.41 ²⁶⁰	7.392 ³⁹	55.81 ¹⁷⁴
20.1	24.654 ³⁹	58.22 ⁷⁰	49.911 ²⁴	35.34 ¹¹⁰	45.94 ²	37.81 ²⁷⁰	7.353 ⁵	54.07 ¹⁹⁴
30.0	24.693 ⁸⁶	57.52 ⁶²	49.935 ⁶⁶	34.24 ¹²⁴	45.92 ¹²	35.11 ²⁷⁵	7.358 ⁴⁷	52.13 ²¹⁰
f. 9.0	24.779 ¹³⁸	56.90 ⁵⁶	50.001 ¹⁰⁶	33.00 ¹³³	46.04 ²⁸	32.36 ²⁷⁰	7.405 ⁹¹	50.03 ²²⁰
19.0	24.917 ¹⁸⁰	56.34 ⁴⁷	50.107 ¹⁴⁴	31.67 ¹⁴⁰	46.32 ⁴²	29.66 ²⁵⁸	7.496 ¹³⁰	47.83 ²²⁵
29.0	25.097 ²¹⁹	55.87 ³⁵	50.251 ¹⁷⁹	30.27 ¹⁴²	46.74 ⁵⁶	27.08 ²⁴¹	7.626 ¹⁶⁷	45.58 ²²³
g. 8.9	25.316 ²⁵⁷	55.52 ²⁵	50.430 ²⁰⁸	28.85 ¹⁴⁰	47.30 ⁶⁸	24.67 ²¹⁶	7.793 ²⁰⁰	43.35 ²¹⁵
18.9	25.573 ²⁸²	55.27 ¹²	50.638 ²³³	27.45 ¹³⁴	47.98 ⁷⁸	22.51 ¹⁸⁸	7.993 ²²⁶	41.20 ²⁰¹
28.9	25.855 ³⁰⁷	55.15 ⁵	50.871 ²⁵⁴	26.11 ¹²¹	48.76 ⁸⁶	20.63 ¹⁵⁵	8.219 ²⁵⁰	39.19 ¹⁷⁹
h. 7.9	26.162 ³²³	55.10 ⁴	51.125 ²⁶⁸	24.90 ¹⁰⁵	49.62 ⁹⁴	19.08 ¹¹⁹	8.469 ²⁶⁷	37.40 ¹⁴⁹
17.8	26.485 ³³⁵	55.14 ¹¹	51.393 ²⁷⁸	23.85 ⁸⁴	50.56 ⁹⁹	17.89 ⁸²	8.736 ²⁸⁰	35.91 ¹¹⁵
27.8	26.820 ³⁴⁴	55.25 ¹⁶	51.671 ²⁸⁵	23.01 ⁵⁸	51.55 ¹⁰²	17.07 ⁴⁴	9.016 ²⁸⁷	34.76 ⁷⁷
i. 6.8	27.164 ³⁴⁵	55.41 ¹⁹	51.956 ²⁸⁷	22.43 ³⁰	52.57 ¹⁰⁴	16.63 ⁴	9.303 ²⁹¹	33.99 ³⁴
16.7	27.509 ³⁴⁵	55.60 ²³	52.243 ²⁸⁶	22.13 ²	53.61 ¹⁰⁴	16.59 ³⁷	9.594 ²⁹⁰	33.65 ¹²
26.7	27.854 ³³⁷	55.83 ²⁵	52.529 ²⁸¹	22.11 ³⁰	54.65 ¹⁰²	16.96 ⁷⁷	9.884 ²⁸⁵	33.77 ⁵⁷
j. 6.7	28.191 ³²⁸	56.08 ²⁸	52.810 ²⁷²	22.41 ⁵⁹	55.67 ⁹⁸	17.73 ¹¹⁶	10.169 ²⁷⁴	34.34 ¹⁰⁰
16.7	28.519 ³¹⁵	56.36 ³¹	53.082 ²⁵⁸	23.00 ⁸⁵	56.65 ⁹²	18.89 ¹⁵³	10.443 ²⁵⁹	35.34 ¹⁴⁰
26.6	28.834 ²⁹²	56.67 ³⁵	53.340 ²⁴²	23.85 ¹⁰⁹	57.57 ⁸⁵	20.42 ¹⁸⁶	10.702 ²⁴¹	36.74 ¹⁷⁷
k. 5.6	29.126 ²⁶⁹	57.02 ³⁵	53.582 ²²⁰	24.94 ¹²⁷	58.42 ⁷⁶	22.28 ²¹⁸	10.943 ²¹⁵	38.51 ²⁰⁶
15.6	29.395 ²³⁹	57.37 ⁴⁴	53.802 ¹⁹⁴	26.21 ¹⁴⁰	59.18 ⁶⁴	24.46 ²⁴⁴	11.158 ¹⁸⁷	40.57 ²²⁵
25.6	29.634 ²⁰¹	57.81 ⁴⁷	53.996 ¹⁶²	27.61 ¹⁴⁸	59.82 ⁵⁰	26.90 ²⁶⁵	11.345 ¹⁵¹	42.82 ²³⁸
l. 5.5	29.835 ¹⁵⁹	58.28 ⁵²	54.158 ¹²⁵	29.09 ¹⁴⁹	60.32 ³⁷	29.55 ²⁷⁸	11.496 ¹¹²	45.20 ²⁴²
15.5	29.994 ¹¹²	58.80 ⁵⁵	54.283 ⁸⁵	30.58 ¹⁴⁵	60.69 ²⁰	32.33 ²⁸³	11.608 ⁷⁰	47.62 ²³⁹
25.5	30.106 ⁵⁸	59.35 ⁵⁴	54.368 ⁴¹	32.03 ¹³⁷	60.89 ²	35.16 ²⁷⁸	11.678 ²⁵	50.01 ²²⁶
35.4	30.164	59.89	54.409	33.40	60.91	37.94	11.703	52.27
m. Place	23.375	57.16	49.002	31.88	45.075	31.18	6.802	48.56
n. Tan δ	1.181	+0.628	1.000	-0.006	3.862	+3.730	1.051	-0.323
o. $D_{\alpha} \alpha$	+0.08	-0.01	+0.06	0.00	+0.16	-0.03	+0.05	0.00
p. $D_{\alpha} \delta$	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϕ^1 Orionis. Mag. 4.5		ι Orionis. Mag. 2.9		ϵ Orionis. Mag. 1.8		ζ Tauri. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 30	° ' " + 9 26	h m 5 31	° ' " - 5 57	h m 5 32	° ' " - 1 15	h m 5 32	° ' " +21 5
	s	"	s	"	s	"	s	"
Jan. 0.5	21.551	6.10	27.639	47.57	5.497	12.70	47.268	36.02
10.4	21.577 ²⁶	5.33 ⁷⁷	27.654 ¹⁵	49.16 ¹⁵⁹	5.517 ²⁰	14.07 ¹³⁷	47.303 ³⁵	37.93 ⁹
20.4	21.557 ²⁰	4.66 ⁶⁷	27.625 ²⁹	50.60 ¹⁴⁴	5.493 ²⁴	15.28 ¹²¹	47.288 ¹⁵	37.87 ⁶
30.4	21.496 ⁶¹	4.08 ⁵⁸	27.554 ⁷¹	51.84 ¹²⁴	5.426 ⁶⁷	16.33 ¹⁰⁵	47.227 ⁶¹	37.82 ⁵
Feb. 9.3	21.394 ¹⁰²	3.59 ⁴⁹	27.444 ¹¹⁰	52.88 ¹⁰⁴	5.321 ¹⁰⁵	17.21 ⁸⁸	47.123 ¹⁰⁴	37.78 ⁴
	133	40	140	79	136	68	138	6
19.3	21.261	3.19	27.304	53.67	5.185	17.89	46.985	37.72
Mar. 1.3	21.102 ¹⁵⁹	2.88 ³¹	27.139 ¹⁶⁵	54.24 ⁵⁷	5.024 ¹⁶¹	18.39 ⁵⁰	46.819 ¹⁶⁶	37.63 ⁹
11.3	20.929 ¹⁷³	2.66 ²²	26.961 ¹⁷⁸	54.57 ³³	4.849 ¹⁷⁵	18.69 ³⁰	46.638 ¹⁸¹	37.49 ¹⁴
21.2	20.752 ¹⁷⁷	2.51 ¹⁵	26.779 ¹⁸²	54.68 ¹¹	4.670 ¹⁷⁹	18.81 ¹²	46.453 ¹⁸⁵	37.32 ¹⁷
31.2	20.582 ¹⁷⁰	2.45 ⁶	26.603 ¹⁷⁶	54.53 ¹⁵	4.497 ¹⁷³	18.74 ⁷	46.274 ¹⁷⁹	37.11 ²¹
	154	2	160	36	156	27	161	25
Apr. 10.2	20.428	2.47	26.443	54.17	4.341	18.47	46.113	36.86
20.2	20.300 ¹²⁸	2.59 ¹²	26.307 ¹³⁶	53.59 ⁵⁸	4.208 ¹³³	18.02 ⁴⁵	45.978 ¹³⁵	36.62 ²⁴
30.1	20.203 ⁹⁷	2.83 ²⁴	26.204 ¹⁰³	52.77 ⁸²	4.108 ¹⁰⁰	17.38 ⁶⁴	45.879 ⁹⁹	36.39 ²³
May 10.1	20.146 ⁶⁷	3.16 ³³	26.137 ⁶⁷	51.76 ¹⁰¹	4.045 ⁶³	16.57 ⁸¹	45.820 ⁵⁹	36.19 ²⁰
20.1	20.130 ¹⁶	3.61 ⁴⁵	26.111 ²⁶	50.55 ¹²¹	4.022 ²³	15.59 ⁹⁸	45.805 ¹⁵	36.03 ¹⁶
	28	57	16	137	19	114	31	8
30.0	20.158	4.18	26.127	49.18	4.041	14.45	45.836	35.95
June 9.0	20.229 ⁷¹	4.86 ⁶⁸	26.185 ⁵⁸	47.66 ¹⁵²	4.103 ⁶²	13.19 ¹²⁶	45.913 ⁷⁷	35.95 ⁰
19.0	20.342 ¹¹³	5.63 ⁷⁷	26.282 ⁹⁷	46.04 ¹⁶²	4.205 ¹⁰²	11.82 ¹³⁷	46.033 ¹²⁰	36.03 ⁸
29.0	20.493 ¹⁵¹	6.47 ⁸⁴	26.419 ¹³⁷	44.36 ¹⁶⁸	4.344 ¹³⁹	10.39 ¹⁴³	46.194 ¹⁶¹	36.19 ¹⁵
July 8.9	20.677 ¹⁸⁴	7.36 ⁸⁹	26.591 ¹⁷²	42.67 ¹⁶⁹	4.518 ¹⁷⁴	8.94 ¹⁴⁵	46.391 ¹⁹⁷	36.44 ²⁶
	216	92	202	164	205	144	228	30
18.9	20.893	8.28	26.793	41.03	4.723	7.50	46.619	36.74
28.9	21.133 ²⁴⁰	9.17 ⁹⁰	27.020 ²²⁷	39.47 ¹⁵⁶	4.952 ²²⁹	6.14 ¹³⁶	46.875 ²⁵⁶	37.08 ³⁴
Aug. 7.9	21.394 ²⁶¹	10.02 ⁸⁵	27.268 ²⁴⁸	38.06 ¹⁴¹	5.203 ²⁵¹	4.91 ¹²³	47.150 ²⁷⁵	37.45 ³⁷
17.8	21.669 ²⁷⁵	10.77 ⁷⁵	27.533 ²⁶⁵	36.86 ¹²⁰	5.468 ²⁶⁵	3.84 ¹⁰⁷	47.442 ²⁹²	37.81 ³⁶
27.8	21.955 ²⁸⁶	11.38 ⁶¹	27.809 ²⁷⁶	35.91 ⁹⁵	5.745 ²⁷⁷	2.98 ⁸⁶	47.747 ³⁰⁵	38.14 ³³
	292	47	283	64	284	58	310	28
Sept. 6.8	22.247	11.85	28.092	35.27	6.029	2.40	48.057	38.42
16.7	22.542 ²⁹⁵	12.11 ²⁶	28.378 ²⁸⁶	34.96 ³¹	6.315 ²⁸⁶	2.10 ³⁰	48.371 ³¹⁴	38.61 ¹⁹
26.7	22.835 ²⁹³	12.18 ⁷	28.663 ²⁸⁵	34.98 ²	6.601 ²⁸⁶	2.10 ⁰	48.683 ³¹²	38.72 ¹¹
Oct. 6.7	23.124 ²⁸⁹	12.05 ¹³	28.943 ²⁸⁰	35.37 ³⁹	6.883 ²⁸²	2.41 ³¹	48.991 ³⁰⁸	38.76 ⁴
16.7	23.404 ²⁸⁰	11.70 ³⁵	29.215 ²⁷²	36.10 ⁷³	7.156 ²⁷³	3.03 ⁶²	49.290 ²⁹⁹	38.71 ⁵
	268	52	259	105	260	89	288	13
26.6	23.672	11.18	29.474	37.15	7.416	3.92	49.578	38.58
Nov. 5.6	23.923 ²⁵¹	10.50 ⁶⁸	29.716 ²⁴²	38.47 ¹³²	7.661 ²⁴⁵	5.07 ¹¹⁵	49.850 ²⁷²	38.40 ¹⁸
15.6	24.154 ²⁸¹	9.70 ⁸⁰	29.935 ²¹⁹	40.01 ¹⁵⁴	7.883 ²²²	6.39 ¹³²	50.099 ²⁴⁹	38.16 ²⁴
25.6	24.357 ²⁰³	8.82 ⁶⁸	30.128 ¹⁹³	41.72 ¹⁷¹	8.080 ¹⁹⁷	7.84 ¹⁴⁵	50.320 ²²¹	37.93 ²³
Dec. 5.5	24.530 ¹⁷³	7.90 ⁹²	30.289 ¹⁶¹	43.51 ¹⁷⁹	8.245 ¹⁶⁵	9.38 ¹⁵⁴	50.510 ¹⁹⁰	37.71 ²²
	137	92	124	181	129	155	151	20
15.5	24.667	6.98	30.413	45.32	8.374	10.93	50.661	37.51
25.5	24.762 ⁹⁵	6.10 ⁸⁸	30.497 ⁸⁴	47.10 ¹⁷⁸	8.462 ⁸⁸	12.45 ¹⁵²	50.768 ¹⁰⁷	37.35 ¹⁶
35.4	24.814 ⁵²	5.28 ⁸²	30.537 ⁴⁰	48.78 ¹⁶⁸	8.508 ⁴⁶	13.89 ¹⁴⁴	50.828 ⁶⁰	37.23 ¹²
Mean Place	19.071	5.91	25.293	46.17	3.119	11.76	44.605	36.75
Sec δ , Tan δ	1.014	+0.166	1.005	-0.104	1.000	-0.022	1.072	+0.386
$D\mu\alpha$, $D\mu\alpha$	+0.07	0.00	+0.06	0.00	+0.06	0.00	+0.07	0.00
$D\mu\delta$, $D\mu\delta$	+0.1	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	ζ Orionis. Mag. 2.0		α Columbe. Mag. 2.8		ο Aurigæ. Mag. 5.5		ζ Leporis. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m s	° ' " 58	h m s	° ' " 6	h m s	° ' " 47	h m s	° ' " 50
n. 0.5	39.633	67.59	43.134	65.68	36.431	33.45	16.689	68.20
10.4	39.657	69.01	43.110	68.49	36.471	35.01	16.705	70.27
20.4	39.636	70.28	43.035	71.02	36.441	36.48	16.675	72.16
30.4	39.572	71.37	42.913	73.22	36.342	37.80	16.601	73.80
b. 9.3	39.469	72.28	42.748	75.04	36.184	38.89	16.487	75.18
19.3	39.335	72.99	42.548	76.44	35.975	39.72	16.341	76.24
ar. 1.3	39.175	73.51	42.324	77.40	35.727	40.26	16.168	77.00
11.3	39.001	73.83	42.084	77.90	35.457	40.45	15.981	77.45
21.2	38.821	73.95	41.839	77.95	35.178	40.31	15.788	77.58
31.2	38.647	73.88	41.601	77.55	34.908	39.84	15.599	77.40
or. 10.2	38.489	73.60	41.380	76.72	34.662	39.06	15.424	76.92
20.2	38.354	73.14	41.184	75.48	34.452	38.01	15.272	76.14
30.1	38.250	72.48	41.022	73.86	34.290	36.72	15.151	75.08
ay 10.1	38.183	71.65	40.900	71.91	34.183	35.27	15.066	73.78
20.1	38.156	70.65	40.822	69.65	34.138	33.71	15.019	72.23
30.0	38.170	69.49	40.792	67.14	34.156	32.09	15.015	70.48
ne 9.0	38.226	68.21	40.810	64.46	34.240	30.46	15.054	68.58
19.0	38.323	66.82	40.875	61.66	34.387	28.87	15.134	66.57
29.0	38.458	65.37	40.987	58.81	34.591	27.38	15.253	64.49
ly 8.9	38.628	63.89	41.142	56.00	34.848	26.00	15.409	62.41
18.9	38.829	62.43	41.334	53.31	35.153	24.79	15.597	60.39
28.9	39.054	61.05	41.562	50.82	35.498	23.74	15.813	58.49
ig. 7.9	39.301	59.79	41.820	48.62	35.874	22.88	16.052	56.80
17.8	39.565	58.72	42.101	46.77	36.278	22.24	16.311	55.35
27.8	39.840	57.86	42.401	45.36	36.700	21.78	16.584	54.22
pt. 6.8	40.122	57.26	42.712	44.43	37.136	21.54	16.866	53.46
16.7	40.409	56.97	43.030	44.05	37.578	21.50	17.153	53.10
26.7	40.695	56.98	43.349	44.21	38.021	21.66	17.442	53.16
t. 6.7	40.977	57.32	43.662	44.94	38.459	22.01	17.728	53.64
16.7	41.251	57.96	43.963	46.21	38.887	22.56	18.006	54.56
26.6	41.513	58.88	44.247	47.99	39.298	23.32	18.273	55.86
iv. 5.6	41.760	60.05	44.507	50.22	39.684	24.25	18.522	57.51
15.6	41.987	61.42	44.738	52.82	40.038	25.36	18.749	59.44
25.6	42.186	62.93	44.933	55.69	40.352	26.63	18.948	61.58
x. 5.5	42.354	64.52	45.086	58.74	40.618	28.04	19.115	63.84
15.5	42.486	66.13	45.193	61.85	40.828	29.56	19.244	66.16
25.5	42.580	67.71	45.251	64.91	40.973	31.14	19.331	68.45
35.4	42.627	69.20	45.257	67.85	41.052	32.72	19.373	70.62
Place	37.254	66.44	40.782	62.00	32.753	30.17	14.362	65.86
, Tan δ	1.001	-0.035	1.208	-0.677	1.549	+1.183	1.035	-0.265
, D _α α	+0.06	0.00	+0.04	0.00	+0.09	-0.01	+0.05	0.00
, D _α δ	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Orionis. Mag. 2.2		δ Doradus. Mag. 4.5		γ Aurigæ. Mag. 4.2		δ Leporis. Mag. 3.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 43	° ' " - 9 41	h m 5 44	° ' " - 65 45	h m 5 45	° ' " + 39 7	h m 5 47	° ' " - 20 52
Jan. 0.5	54.376	54.20	40.69	63.22	51.527	34.83	49.988	69.44
10.4	54.399 ²³	56.04 ¹⁸⁴	40.50 ¹⁹	66.59 ³³⁷	51.578 ⁵¹	35.80 ⁹⁷	50.000 ¹²	71.84 ²⁴⁰
20.4	54.376 ²³	57.69 ¹⁶⁵	40.22 ²⁸	69.65 ³⁰⁶	51.570 ⁸	36.73 ⁹³	49.966 ³⁴	74.01 ²¹⁷
30.4	54.310 ⁶⁶	59.14 ¹⁴⁵	39.86 ³⁶	72.33 ²⁶⁸	51.504 ⁶⁶	37.58 ⁸⁵	49.886 ⁸⁰	75.92 ¹⁹¹
Feb. 9.4	54.204 ¹³⁰	60.34 ¹²⁰	39.42 ⁴⁴	74.55 ²²²	51.386 ¹¹⁸	38.30 ⁷²	49.766 ¹²⁰	77.51 ¹⁵⁹
19.3	54.065 ¹³⁰	61.29 ⁹⁵	38.92 ⁵⁰	76.27 ¹⁷²	51.223 ¹⁶³	38.86 ⁵⁶	49.611 ¹⁵⁵	78.76 ¹²⁵
Mar. 1.3	53.900 ¹⁶⁵	61.96 ⁶⁷	38.38 ⁵⁴	77.45 ¹¹⁸	51.028 ¹⁹⁵	39.23 ³⁷	49.430 ¹⁸¹	79.68 ⁹²
11.3	53.720 ¹⁸⁰	62.37 ⁴¹	37.82 ⁵⁶	78.09 ⁶⁴	50.809 ¹³	39.36 ¹³	49.233 ¹⁹⁷	80.21 ⁵³
21.2	53.533 ¹⁸⁷	62.50 ¹³	37.25 ⁵⁷	78.18 ⁹	50.583 ²²⁶	39.27 ⁹	49.029 ³⁰⁴	80.38 ¹⁷
31.2	53.351 ¹⁸²	62.37 ¹³	36.68 ⁵⁷	77.72 ⁴⁶	50.362 ²²¹	38.94 ³³	48.828 ³⁰¹	80.20 ¹⁸
Apr. 10.2	53.184 ¹⁶⁷	61.98 ³⁹	36.14 ⁵⁴	76.75 ⁹⁷	50.160 ³⁰²	38.42 ⁵²	48.641 ¹⁸⁷	79.67 ⁵³
20.2	53.038 ¹⁴⁶	61.33 ⁶⁵	35.65 ⁴⁹	75.29 ¹⁴⁶	49.987 ¹⁷³	37.70 ⁷²	48.477 ¹⁶⁴	78.80 ⁸⁷
30.1	52.924 ¹¹⁴	60.45 ⁸⁸	35.21 ⁴⁴	73.37 ¹⁹²	49.853 ¹³⁴	36.82 ⁸⁸	48.343 ¹³⁴	77.61 ¹¹⁹
May 10.1	52.844 ⁸⁰	59.33 ¹¹²	34.83 ³⁸	71.05 ²³²	49.765 ⁸⁸	35.85 ⁹⁷	48.244 ⁹⁹	76.14 ¹⁴⁷
20.1	52.804 ⁴⁰	58.00 ¹³³	34.54 ²⁹	68.37 ²⁶⁸	49.729 ³⁶	34.80 ¹⁰⁶	48.186 ⁵⁸	74.41 ¹⁷³
30.1	52.805 ¹	56.49 ¹⁵¹	34.32 ²²	65.40 ²⁹⁷	49.746 ¹⁷	33.73 ¹⁰⁷	48.170 ¹⁶	72.45 ¹⁹⁶
June 9.0	52.848 ⁴³	54.83 ¹⁶⁶	34.20 ¹²	62.23 ³¹⁷	49.818 ⁷²	32.66 ¹⁰⁷	48.198 ²⁸	70.32 ²¹³
19.0	52.933 ⁸⁵	53.06 ¹⁷⁷	34.16 ⁴	58.94 ³²⁹	49.942 ¹²⁴	31.65 ¹⁰¹	48.268 ⁷⁰	68.07 ²²⁵
29.0	53.056 ¹²³	51.23 ¹⁸³	34.22 ⁶	55.59 ³³⁵	50.115 ¹⁷³	30.71 ⁹⁴	48.379 ¹¹¹	65.76 ²³¹
July 8.9	53.214 ¹⁵⁶	49.39 ¹⁸⁴	34.37 ¹⁵	52.28 ³³¹	50.333 ²¹⁸	29.87 ⁸⁴	48.529 ¹⁵⁰	63.45 ²³¹
18.9	53.403 ¹⁸⁹	47.59 ¹⁸⁰	34.61 ²⁴	49.12 ³¹⁶	50.590 ²⁶⁷	29.15 ⁷²	48.711 ¹⁸²	61.21 ²²⁴
28.9	53.620 ²¹⁷	45.91 ¹⁶⁸	34.92 ³¹	46.20 ²⁹²	50.879 ²⁸⁹	28.55 ⁶⁰	48.924 ²¹³	59.12 ²⁰⁹
Aug. 7.9	53.859 ²³⁹	44.38 ¹⁵³	35.31 ³⁹	43.62 ²⁵⁸	51.197 ³¹⁸	28.06 ⁴⁹	49.163 ³³⁹	57.24 ¹⁸⁸
17.8	54.117 ²⁵⁸	43.09 ¹²⁹	35.76 ⁴⁵	41.46 ²¹⁶	51.536 ³³⁹	27.70 ³⁶	49.422 ³⁵⁹	55.66 ¹⁵⁸
27.8	54.388 ²⁷¹	42.06 ¹⁰⁸	36.26 ⁵⁰	39.79 ¹⁶⁷	51.892 ³⁵⁶	27.46 ²⁴	49.697 ²⁷⁵	54.42 ¹²⁴
Sept. 6.8	54.668 ²⁸⁰	41.37 ⁶⁹	36.80 ⁵⁴	38.69 ¹¹⁰	52.258 ³⁶⁶	27.32 ¹⁴	49.983 ²⁸⁶	53.59 ⁸³
16.8	54.954 ²⁸⁶	41.03 ³⁴	37.35 ⁵⁵	38.22 ⁴⁷	52.630 ³⁷²	27.28 ⁴	50.276 ²⁹³	53.19 ⁴⁰
26.7	55.240 ²⁸⁶	41.08 ⁵	37.92 ⁵⁷	38.39 ¹⁷	53.005 ³⁷⁵	27.34 ⁶	50.570 ²⁹⁴	53.27 ⁸
Oct. 6.7	55.524 ²⁸⁴	41.50 ⁴²	38.48 ⁵⁶	39.22 ⁸³	53.376 ³⁷¹	27.50 ¹⁶	50.863 ²⁹³	53.83 ⁵⁶
16.7	55.801 ²⁷⁷	42.32 ⁸²	39.01 ⁵³	40.70 ¹⁴⁸	53.740 ³⁶⁴	27.77 ²⁷	51.148 ²⁸⁵	54.86 ¹⁰³
26.6	56.067 ²⁶⁶	43.48 ¹¹⁶	39.50 ⁴⁹	42.76 ²⁰⁶	54.088 ³⁴⁸	28.13 ³⁶	51.421 ²⁷³	56.32 ¹⁴⁶
Nov. 5.6	56.315 ²⁴⁸	44.94 ¹⁴⁶	39.93 ⁴³	45.36 ²⁶⁰	54.423 ³³⁵	28.59 ⁴⁶	51.675 ²⁵⁴	58.16 ¹⁸⁴
15.6	56.544 ²²⁹	46.67 ¹⁷³	40.29 ³⁶	48.40 ³⁰⁴	54.730 ³⁰⁷	29.15 ⁵⁶	51.907 ²³²	60.33 ²¹⁷
25.6	56.746 ²⁰²	48.57 ¹⁹⁰	40.57 ²⁸	51.77 ³³⁷	55.007 ³³⁷	29.83 ⁶⁸	52.110 ³⁰³	62.74 ²⁴¹
Dec. 5.5	56.916 ¹⁷⁰	50.59 ²⁰²	40.76 ¹⁹	55.37 ³⁶⁰	55.244 ²³⁷	30.61 ⁷⁸	52.279 ¹⁶⁹	65.32 ²⁵⁸
15.5	57.049 ¹³³	52.64 ²⁰⁵	40.84 ⁸	59.06 ³⁶⁹	55.436 ¹⁹²	31.47 ⁸⁶	52.409 ¹³⁰	67.95 ²⁶³
25.5	57.143 ⁹⁴	54.66 ²⁰²	40.82 ²	62.73 ³⁶⁷	55.575 ¹³⁹	32.39 ⁹²	52.495 ⁸⁶	70.54 ²⁵⁹
35.5	57.191 ⁴⁸	56.59 ¹⁹³	40.70 ¹²	66.25 ³⁵²	55.658 ⁸³	33.36 ⁹⁷	52.534 ³⁹	73.04 ²⁵⁰
Mean Place	52.031	52.25	37.415	58.66	48.356	32.94	47.663	66.69
Sec δ , Tan δ	1.014	-0.171	2.436	-2.222	1.289	+0.813	1.070	-0.382
$D\alpha$, D_{α}	+0.06	0.00	0.00	+0.01	+0.08	0.00	+0.05	0.00
$D\delta$, D_{δ}	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Orionis. (Betelgeux.) Var. 1.0-1.4		η Leporis. Mag. 3.8		δ Aurigæ. Mag. 3.9		β Aurigæ. Mag. 2.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m s 50	° ' " + 7 23	h m s 52	° ' " -14 10	h m s 52	° ' " +54 16	h m s 53	° ' " +44 56
Jan. 0.5	46.418	33.27	42.532	56.85	50.600	50.46	34.305	27.41
10.4	46.462	32.34	42.558	58.93	50.657	52.26	34.365	28.70
20.4	46.459	31.52	42.537	60.84	50.636	53.99	34.359	29.96
30.4	46.412	30.82	42.472	62.49	50.539	55.56	34.290	31.11
Feb. 9.4	46.322	30.24	42.365	63.88	50.373	56.92	34.163	32.11
19.3	46.197	29.78	42.225	64.98	50.149	57.99	33.986	32.91
Mar. 1.3	46.045	29.43	42.057	65.78	49.879	58.74	33.771	33.46
11.3	45.875	29.20	41.873	66.27	49.579	59.12	33.531	33.73
21.3	45.698	29.06	41.681	66.44	49.268	59.13	33.280	33.72
31.2	45.524	29.03	41.492	66.31	48.963	58.75	33.033	33.42
Apr. 10.2	45.364	29.10	41.315	65.89	48.679	58.02	32.804	32.85
20.2	45.225	29.29	41.160	65.17	48.431	56.96	32.607	32.02
30.1	45.118	29.58	41.035	64.18	48.232	55.63	32.450	31.00
May 10.1	45.046	29.99	40.942	62.93	48.093	54.07	32.342	29.81
20.1	45.014	30.51	40.889	61.46	48.018	52.36	32.290	28.51
30.1	45.023	31.15	40.878	59.78	48.014	50.54	32.296	27.15
June 9.0	45.074	31.90	40.909	57.94	48.078	48.68	32.359	25.77
19.0	45.165	32.73	40.981	55.99	48.212	46.83	32.479	24.41
29.0	45.296	33.62	41.092	53.97	48.410	45.05	32.653	23.12
July 8.9	45.461	34.56	41.240	51.93	48.668	43.38	32.877	21.94
18.9	45.657	35.50	41.420	49.95	48.980	41.84	33.144	20.86
28.9	45.881	36.42	41.628	48.08	49.338	40.48	33.449	19.91
Aug. 7.9	46.125	37.27	41.862	46.41	49.736	39.32	33.785	19.11
17.8	46.388	38.00	42.116	44.97	50.165	38.36	34.147	18.47
27.8	46.664	38.59	42.383	43.84	50.620	37.64	34.528	17.98
Sept. 6.8	46.949	39.00	42.663	43.06	51.091	37.14	34.924	17.65
16.8	47.240	39.20	42.949	42.68	51.573	36.88	35.328	17.47
26.7	47.532	39.19	43.237	42.70	52.060	36.85	35.735	17.44
Oct. 6.7	47.824	38.94	43.524	43.17	52.545	37.08	36.141	17.57
16.7	48.110	38.48	43.806	44.05	53.021	37.54	36.540	17.86
26.6	48.387	37.80	44.076	45.32	53.482	38.25	36.926	18.30
Nov. 5.6	48.649	36.96	44.331	46.93	53.917	39.18	37.294	18.90
15.6	48.894	35.99	44.565	48.83	54.319	40.35	37.635	19.67
25.6	49.113	34.92	44.773	50.95	54.678	41.72	37.942	20.59
Dec. 5.5	49.304	33.81	44.949	53.20	54.985	43.27	38.207	21.64
15.5	49.458	32.70	45.088	55.50	55.231	44.97	38.422	22.82
25.5	49.571	31.64	45.185	57.78	55.407	46.75	38.580	24.07
35.5	49.641	30.65	45.237	59.96	55.507	48.57	38.675	25.37
Mean Place	43.931	34.14	40.193	54.48	46.578	48.19	30.866	25.78
Sec δ , Tan δ	1.008	+0.130	1.031	-0.253	1.713	+1.391	1.413	+0.998
$D\psi\alpha$, $D_w\alpha$	+0.06	0.00	+0.05	0.00	+0.10	0.00	+0.09	0.00
$D\psi\delta$, $D_w\delta$	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time	θ Aurigæ. Mag. 2.7		1 Geminorum. Mag. 4.3		1 G. Puppis. Mag. 6.2		γ Orionis. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 54	° ' " +37 12	h m 5 59	° ' " +23 16	h m 6 2	° ' " -45 1	h m 6 2	° ' " +14 46
Jan. 0.5	10.894	30.04	10.896	7.57	9.322	73.26	56.084	44.55
10.4	10.955	30.89	10.958	7.56	9.298	76.52	56.094	44.03
20.4	10.956	31.73	10.968	7.61	9.213	79.51	56.106	43.60
30.4	10.901	32.51	10.928	7.70	9.071	82.16	56.069	43.25
Feb. 9.4	10.793	33.19	10.841	7.80	8.878	84.41	55.988	42.98
19.3	10.641	33.74	10.715	7.89	8.643	86.22	55.869	42.78
Mar. 1.3	10.455	34.11	10.557	7.94	8.374	87.57	55.720	42.63
11.3	10.244	34.28	10.379	7.94	8.084	88.39	55.550	42.50
21.3	10.025	34.25	10.191	7.88	7.784	88.72	55.371	42.41
31.2	9.810	33.99	10.005	7.76	7.485	88.54	55.193	42.35
Apr. 10.2	9.609	33.55	9.833	7.58	7.200	87.88	55.027	42.31
20.2	9.437	32.94	9.682	7.34	6.939	86.75	54.882	42.31
30.1	9.302	32.17	9.564	7.09	6.711	85.19	54.767	42.35
May 10.1	9.211	31.30	9.484	6.82	6.522	83.22	54.687	42.44
20.1	9.169	30.36	9.446	6.59	6.381	80.92	54.648	42.60
30.1	9.178	29.40	9.452	6.36	6.292	78.30	54.649	42.84
June 9.0	9.240	28.44	9.504	6.18	6.254	75.46	54.693	43.14
19.0	9.352	27.52	9.599	6.06	6.271	72.45	54.780	43.51
29.0	9.512	26.66	9.736	5.99	6.341	69.37	54.906	43.94
July 9.0	9.716	25.88	9.912	5.99	6.463	66.29	55.068	44.42
18.9	9.959	25.20	10.121	6.04	6.633	63.32	55.261	44.92
28.9	10.234	24.62	10.359	6.12	6.848	60.52	55.483	45.42
Aug. 7.9	10.538	24.14	10.622	6.22	7.103	58.00	55.728	45.89
17.8	10.864	23.76	10.904	6.32	7.390	55.84	55.993	46.30
27.8	11.206	23.48	11.201	6.41	7.707	54.13	56.273	46.62
Sept. 6.8	11.561	23.30	11.510	6.46	8.044	52.93	56.563	46.82
16.8	11.923	23.18	11.825	6.45	8.398	52.29	56.861	46.89
26.7	12.289	23.15	12.143	6.39	8.757	52.26	57.162	46.82
Oct. 6.7	12.653	23.19	12.462	6.26	9.116	52.85	57.465	46.58
16.7	13.012	23.31	12.776	6.06	9.465	54.05	57.764	46.21
26.7	13.359	23.53	13.080	5.81	9.799	55.82	58.055	45.70
Nov. 5.6	13.691	23.84	13.373	5.54	10.107	58.12	58.335	45.09
15.6	13.999	24.24	13.648	5.26	10.382	60.86	58.596	44.39
25.6	14.279	24.75	13.896	4.99	10.617	63.95	58.835	43.66
Dec. 5.5	14.521	25.36	14.113	4.77	10.803	67.27	59.044	42.92
15.5	14.719	26.08	14.293	4.59	10.935	70.72	59.217	42.22
25.5	14.866	26.87	14.430	4.49	11.009	74.18	59.349	41.57
35.5	14.957	27.70	14.518	4.45	11.022	77.55	59.436	41.00
Mean Place	7.777	28.98	8.153	7.80	6.808	69.76	53.437	45.52
Sec δ , Tan δ	1.256	+0.759	1.089	+0.430	1.415	-1.001	1.034	+0.284
$D\phi a$, $D\omega a$	+0.08	0.00	+0.07	0.00	+0.03	0.00	+0.07	0.00
$D\phi \delta$, $D\omega \delta$	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

APPARENT PLACES OF STARS, 1918.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	22 H. Camelop. Mag. 4.7		77 Geminorum. Var. 3.2-4.2		2 Lyncis. Mag. 4.4		5 Canis Majoris Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 9	° ' " +69 20	h m 6 9	° ' " +22 31	h m 6 12	° ' " +59 2	h m 6 17	° ' " -30
Jan. 0.5	54.99	63.66	58.459	53.06	27.989	32.93	12.209	38.43
10.5	55.08	66.19	58.531	53.00	28.080	34.98	12.237	41.32
20.4	55.04	68.64	58.551	53.01	28.080	36.99	12.213	43.99
30.4	54.87	70.92	58.520	53.07	27.992	38.87	12.138	46.39
Feb. 9.4	54.59	72.92	58.442	53.16	27.823	40.53	12.017	48.44
19.3	54.20	74.56	58.322	53.25	27.582	41.93	11.856	50.11
Mar. 1.3	53.74	75.79	58.169	53.32	27.286	42.97	11.664	51.39
11.3	53.23	76.55	57.995	53.36	26.950	43.63	11.449	52.26
21.3	52.69	76.82	57.809	53.34	26.594	43.88	11.222	52.69
31.2	52.14	76.58	57.623	53.27	26.238	43.71	10.994	52.71
Apr. 10.2	51.63	75.85	57.447	53.14	25.898	43.13	10.777	52.31
20.2	51.16	74.66	57.294	52.97	25.594	42.18	10.577	51.50
30.2	50.47	73.07	57.171	52.77	25.338	40.88	10.405	50.31
May 10.1	50.47	71.15	57.083	52.56	25.145	39.29	10.265	48.77
20.1	50.26	68.95	57.036	52.35	25.019	37.48	10.164	46.92
30.1	50.15	66.56	57.033	52.17	24.971	35.51	10.106	44.79
June 9.0	50.16	64.03	57.074	52.03	24.999	33.43	10.091	42.44
19.0	50.29	61.47	57.159	51.93	25.104	31.33	10.121	39.93
29.0	50.52	58.93	57.285	51.88	25.285	29.25	10.194	37.32
July 9.0	50.85	56.47	57.449	51.88	25.533	27.24	10.309	34.69
18.9	51.27	54.16	57.647	51.92	25.846	25.34	10.462	32.13
28.9	51.78	52.04	57.874	51.99	26.214	23.60	10.649	29.70
Aug. 7.9	52.37	50.15	58.127	52.06	26.632	22.06	10.869	27.49
17.9	53.01	48.55	58.400	52.12	27.091	20.73	11.115	25.57
27.8	53.71	47.24	58.689	52.16	27.582	19.64	11.384	24.03
Sept. 6.8	54.44	46.24	58.992	52.15	28.098	18.80	11.671	22.92
16.8	55.20	45.60	59.303	52.07	28.633	18.23	11.973	22.30
26.7	55.98	45.31	59.618	51.93	29.178	17.93	12.282	22.20
Oct. 6.7	56.76	45.39	59.936	51.70	29.727	17.91	12.593	22.65
16.7	57.52	45.82	60.252	51.42	30.268	18.19	12.902	23.64
26.7	58.27	46.64	60.560	51.08	30.797	18.76	13.201	25.14
Nov. 5.6	58.98	47.81	60.857	50.70	31.302	19.60	13.485	27.11
15.6	59.63	49.32	61.138	50.32	31.774	20.74	13.747	29.46
25.6	60.21	51.15	61.395	49.95	32.199	22.13	13.981	32.15
Dec. 5.6	60.70	53.26	61.621	49.63	32.568	23.76	14.178	35.06
15.5	61.10	55.58	61.811	49.38	32.870	25.58	14.334	38.10
25.5	61.38	58.04	61.958	49.19	33.093	27.54	14.443	41.14
35.5	61.55	60.58	62.057	49.09	33.235	29.59	14.502	44.11
Mean Place	48.843	62.50	55.721	54.03	23.502	32.46	9.831	35.55
Sec δ , Tan δ	2.835	+2.653	1.083	+0.415	1.944	+1.667	1.155	-0.578
D ϕ α , D ω α	+0.13	+0.01	+0.07	0.00	+0.11	+0.01	+0.05	0.00
D ϕ δ , D ω δ	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

	μ Geminorum. Mag. 3.2			ψ^1 Aurigæ. Mag. 5.1			β Canis Majoris. Mag. 2.0			δ Monocerotis. Mag. 4.5		
Washington Mean Time.	Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.	
	h m 6 18	° ' " +22 33		h m 6 18	° ' " +49 19		h m 6 19	° ' " -17 54		h m 6 19	° ' " + 4 38	
	s 2.761	" 23.13		s 38.870	" 51.85		s 7.653	" 54.02		s 27.886	" 5.70	
Jan. 0.5	2.761 ⁸⁰	23.13 ⁷		38.870 ⁹⁵	51.85 ¹⁵⁴		7.653 ⁴⁸	54.02 ²³⁸		27.886 ⁶⁹	5.70 ¹¹⁶	
10.5	2.841 ²⁸	23.06 ⁰		38.965 ²⁴	53.39 ¹⁵³		7.701 ³	56.40 ²¹⁹		27.955 ²¹	4.54 ¹⁰⁴	
20.4	2.869 ⁷⁴	23.06 ⁶		38.989 ⁴⁹	54.92 ¹⁴⁶		7.698 ⁹³	58.59 ¹⁹⁶		27.976 ²⁷	3.50 ⁷²	
30.4	2.845 ²¹	23.12 ¹⁰		38.940 ¹¹⁵	56.38 ¹³²		7.649 ⁴⁹	60.55 ¹³⁷		27.949 ⁷¹	2.60 ⁷⁰	
Feb. 9.4	2.774 ¹¹⁴	23.22 ¹¹		38.825 ¹⁷³	57.70 ¹¹²		7.556 ¹³²	62.22 ¹⁶⁶		27.878 ¹⁰⁹	1.88 ⁵⁸	
19.3	2.660	23.33		38.652	58.82		7.424	63.58		27.769	1.30	
Mar. 1.3	2.512 ¹⁴⁸	23.43 ¹⁰		38.432 ²²⁰	59.69 ⁸⁷		7.261 ¹⁶³	64.61 ¹⁰³		27.629 ¹⁴⁰	0.86 ⁴⁴	
11.3	2.340 ¹⁷²	23.49 ⁶		38.177 ²⁵⁵	60.26 ⁵⁷		7.077 ¹⁸⁴	65.30 ⁶⁹		27.466 ¹⁶³	0.58 ²⁸	
21.3	2.155 ¹⁸⁵	23.51 ²		37.905 ²⁷²	60.51 ²⁵		6.882 ¹⁹⁵	65.66 ³⁶		27.291 ¹⁷⁵	0.43 ¹⁵	
31.2	1.968 ¹⁸⁷	23.47 ⁴		37.631 ²⁷⁴	60.43 ⁸		6.685 ¹⁹⁷	65.69 ³		27.115 ¹⁷⁶	0.41 ²	
	177	10		259	40		188	32		166	10	
Apr. 10.2	1.791	23.37		37.372	60.03		6.497	65.37		26.949	0.51	
20.2	1.635 ¹⁵⁶	23.22 ¹⁵		37.137 ²³⁵	59.31 ⁷²		6.327 ¹⁷⁰	64.73 ⁶⁴		26.799 ¹⁵⁰	0.75 ²⁴	
30.2	1.507 ¹²⁸	23.04 ¹⁸		36.941 ¹⁹⁶	58.33 ⁹⁸		6.181 ¹⁴⁶	63.80 ⁹³		26.676 ¹²³	1.11 ³⁶	
May 10.1	1.414 ⁹³	22.85 ¹⁹		36.794 ¹⁴⁷	57.12 ¹²¹		6.068 ¹¹³	62.58 ¹²²		26.584 ⁹²	1.59 ⁴⁸	
20.1	1.361 ⁵³	22.65 ²⁰		36.703 ⁹¹	55.73 ¹³⁹		5.991 ⁷⁷	61.11 ¹⁴⁷		26.529 ⁵⁵	2.19 ⁶⁰	
	10	19		32	151		38	171		16	73	
30.1	1.351	22.46		36.671	54.22		5.953	59.40		26.513	2.92	
June 9.0	1.385 ³⁴	22.31 ¹⁵		36.700 ²⁹	52.63 ¹⁵⁹		5.955 ²	57.52 ¹⁸⁸		26.538 ²⁵	3.74 ⁸²	
19.0	1.462 ⁷⁷	22.19 ¹²		36.790 ⁹⁰	51.00 ¹⁶³		5.999 ⁴⁴	55.49 ²⁰³		26.602 ⁶⁴	4.64 ⁹⁰	
29.0	1.580 ¹¹⁸	22.12 ⁷		36.938 ¹⁴⁸	49.39 ¹⁶¹		6.083 ⁸⁴	53.36 ²¹³		26.704 ¹⁰²	5.61 ⁹⁷	
July 9.0	1.737 ¹⁵⁷	22.08 ⁴		37.141 ²⁰³	47.84 ¹⁵⁵		6.204 ¹²¹	51.23 ²¹³		26.841 ¹³⁷	6.60 ⁹⁶	
	190	1		253	147		155	209		170	100	
18.9	1.927	22.07		37.394	46.37		6.359	49.14		27.011	7.60	
28.9	2.148 ²²¹	22.09 ²		37.690 ²⁹⁶	45.02 ¹³⁵		6.545 ¹⁸⁶	47.14 ²⁰⁰		27.208 ¹⁹⁷	8.55 ⁹⁵	
Aug. 7.9	2.395 ²⁴⁷	22.12 ³		38.025 ³³⁵	43.81 ¹²¹		6.759 ²¹⁴	45.32 ¹⁸²		27.430 ²²²	9.42 ⁸⁷	
17.9	2.663 ²⁶⁸	22.13 ¹		38.391 ³⁶⁶	42.75 ¹⁰⁶		6.996 ²³⁷	43.76 ¹⁵⁶		27.673 ²⁴³	10.15 ⁷⁵	
27.8	2.948 ²⁸⁵	22.10 ³		38.784 ³⁹³	41.85 ⁹⁰		7.253 ²⁵⁷	42.50 ¹²⁶		27.933 ²⁶⁰	10.74 ⁵⁴	
	298	7		413	72		271	89		272	38	
Sept. 6.8	3.246	22.03		39.197	41.13		7.524	41.61		28.205	11.12	
16.8	3.556 ³¹⁰	21.90 ¹³		39.625 ⁴²⁸	40.59 ⁵⁴		7.807 ²⁸³	41.12 ⁴⁹		28.487 ²⁸²	11.26 ¹	
26.7	3.872 ³¹⁶	21.68 ²²		40.062 ⁴³⁷	40.23 ³⁶		8.097 ²⁹⁰	41.08 ⁴		28.776 ²⁸⁹	11.16 ¹¹	
Oct. 6.7	4.190 ³¹⁸	21.40 ²⁸		40.504 ⁴⁴²	40.08 ¹⁵		8.391 ²⁹⁴	41.50 ⁴²		29.068 ²⁹²	10.80 ³	
16.7	4.508 ³¹⁸	21.05 ³⁵		40.943 ⁴³⁹	40.12 ⁴		8.683 ²⁹²	42.37 ⁸⁷		29.359 ²⁹¹	10.19 ⁶	
	313	40		431	26		285	130		287	8	
26.7	4.821	20.65		41.374	40.38		8.968	43.67		29.646	9.35	
Nov. 5.6	5.122 ³⁰¹	20.22 ⁴³		41.789 ⁴¹⁵	40.85 ⁴⁷		9.241 ²⁷³	45.36 ¹⁶⁹		29.923 ²⁷⁷	8.31 ¹⁰	
15.6	5.408 ²⁸⁶	19.78 ⁴⁴		42.179 ³⁹⁰	41.55 ⁷⁰		9.496 ²⁵⁵	47.39 ²⁰³		30.183 ²⁸⁰	7.11 ¹²	
25.6	5.671 ²⁶³	19.36 ⁴²		42.536 ³⁵⁷	42.45 ⁹⁰		9.727 ²³¹	49.66 ²²⁷		30.424 ²⁴¹	5.80 ¹³	
Dec. 5.6	5.906 ²³⁵	18.99 ³⁷		42.851 ³¹⁵	43.55 ¹¹⁰		9.926 ¹⁹⁹	52.10 ²⁴⁴		30.636 ²¹²	4.44 ¹³	
	198	30		263	128		163	254		178	13	
15.5	6.104	18.69		43.114	44.83		10.089	54.64		30.814	3.07	
25.5	6.259 ¹⁵⁵	18.49 ²⁰		43.316 ²⁰²	46.25 ¹⁴²		10.209 ¹²⁰	57.18 ²⁵⁴		30.954 ¹⁴⁰	1.75 ¹³	
35.5	6.367 ¹⁰⁸	18.37 ¹²		43.451 ¹³⁵	47.75 ¹⁵⁰		10.283 ⁷⁴	59.64 ²⁴⁶		31.048 ⁹⁴	0.52 ¹²	
Mean Place	0.017	24.62		35.164	52.40		5.296	51.34		25.405	7.86	
Sec δ , Tan δ	1.083	+0.415		1.534	+1.164		1.051	-0.323		1.003	+0.081	
$D\psi\alpha$, $D\omega\alpha$	+0.07	0.00		+0.09	+0.01		+0.05	0.00		+0.06	0.00	
$D\psi\delta$, $D\omega\delta$	0.0	+1.0		0.0	+1.0		0.0	+1.0		0.0	+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Argus. (Canopus.) Mag. -0.9		10 Monocerotis. Mag. 5.0		γ Geminorum. Mag. 4.1		δ Lyncis. Mag. 6.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 22	° ' -52 38	h m 6 23	° ' - 4 42	h m 6 24	° ' +20 15	h m 6 30	° ' +61 33
	s 6 22	" -52 38	s 6 23	" - 4 42	s 6 24	" +20 15	s 6 30	" +61 33
Jan. 0.5	10.608	64.81	57.069	40.11	8.368	52.69	16.89	16.58
10.5	10.587 21	68.31 350	57.154 65	41.84 173	8.453 85	52.46 23	17.01 12	18.74 216
20.4	10.494 93	71.61 330	57.172 18	43.39 153	8.486 83	52.32 14	17.04 3	20.88 214
30.4	10.334 160	74.58 297	57.142 30	44.77 138	8.468 18	52.26 6	16.97 7	22.93 205
Feb. 9.4	10.113 221	77.16 258	57.069 73	45.93 116	8.403 65	52.26 0	16.80 17	24.81 188
	273	214	112	94	108	4	24	160
19.4	9.840	79.30	56.957	46.87	8.295	52.30	16.56	26.41
Mar. 1.3	9.526 314	80.96 166	56.814 143	47.57 70	8.153 142	52.35 5	16.26 30	27.68 127
11.3	9.183 343	82.11 115	56.648 166	48.05 48	7.985 168	52.39 4	15.90 36	28.56 88
21.3	8.825 358	82.74 63	56.471 177	48.30 25	7.804 181	52.41 2	15.52 38	29.03 47
31.2	8.464 361	82.84 10	56.291 180	48.33 3	7.621 183	52.40 1	15.13 39	29.06 3
	350	42	173	19	176	4	38	42
Apr. 10.2	8.114	82.42	56.118	48.14	7.445	52.36	14.75	28.64
20.2	7.785 329	81.50 92	55.964 154	47.75 39	7.289 156	52.29 7	14.40 35	27.81 83
30.2	7.489 296	80.11 139	55.834 130	47.15 60	7.160 129	52.20 9	14.10 30	26.60 121
May 10.1	7.235 254	78.28 183	55.734 100	46.35 80	7.063 97	52.10 10	13.87 23	25.07 153
20.1	7.029 206	76.05 223	55.670 64	45.38 97	7.006 57	52.01 9	13.70 17	23.27 180
	151	256	26	115	15	6	10	201
30.1	6.878	73.49	55.644	44.23	6.991	51.95	13.60	21.26
June 9.1	6.787 91	70.66 288	55.658 14	42.96 127	7.018 27	51.92 3	13.59 1	19.09 217
19.0	6.755 32	67.62 304	55.711 53	41.58 138	7.087 69	51.92 0	13.66 7	16.86 223
29.0	6.783 28	64.47 315	55.801 90	40.12 146	7.197 110	51.96 4	13.81 15	14.61 225
July 9.0	6.873 90	61.28 319	55.927 126	38.63 149	7.345 148	52.04 8	14.04 23	12.39 222
	148	313	159	147	181	10	30	212
18.9	7.021	58.15	56.086	37.16	7.526	52.14	14.34	10.27
28.9	7.223 202	55.18 297	56.273 187	35.75 141	7.739 213	52.25 11	14.70 36	8.27 200
Aug. 7.9	7.475 252	52.47 271	56.486 213	34.47 128	7.976 237	52.36 11	15.12 42	6.44 183
17.9	7.773 298	50.09 238	56.720 234	33.38 109	8.236 260	52.43 7	15.58 46	4.82 162
27.8	8.109 336	48.15 194	56.972 252	32.60 88	8.513 277	52.45 2	16.09 51	3.42 140
	367	142	266	59	292	5	54	113
Sept. 6.8	8.476	46.73	57.238	31.91	8.806	52.40	16.63	2.29
16.8	8.866 390	45.88 85	57.515 277	31.62 29	9.108 303	52.27 13	17.19 56	1.41 88
26.8	9.271 405	45.64 24	57.800 285	31.66 4	9.417 309	52.03 24	17.77 58	0.84 57
Oct. 6.7	9.681 410	46.05 41	58.088 288	32.05 39	9.731 314	51.70 33	18.36 59	0.56 28
16.7	10.085 404	47.09 104	58.376 288	32.78 73	10.044 313	51.28 42	18.94 58	0.59 3
	389	166	294	105	309	49	58	36
26.7	10.474	48.75	58.660	33.83	10.353	50.79	19.52	0.95
Nov. 5.6	10.836 362	50.97 222	58.933 273	35.16 133	10.652 299	50.24 55	20.08 56	1.63 68
15.6	11.164 328	53.70 273	59.191 258	36.73 157	10.938 286	49.67 57	20.61 53	2.62 99
25.6	11.443 279	56.83 313	59.429 238	38.47 174	11.201 263	49.10 57	21.09 48	3.92 130
Dec. 5.6	11.668 225	60.25 342	59.638 209	40.32 185	11.437 236	48.57 53	21.51 42	5.50 158
	163	359	175	190	200	47	35	182
15.5	11.831	63.84	59.813	42.22	11.637	48.10	21.86	7.32
25.5	11.924 93	67.50 366	59.948 135	44.09 187	11.796 159	47.72 38	22.12 26	9.33 201
35.5	11.946 22	71.10 380	60.041 93	45.89 180	11.908 112	47.43 29	22.30 18	11.46 213
Mean Place	7.897	61.97	54.682	37.61	5.668	54.64	12.096	17.93
Sec δ , Tan δ	1.648	-1.310	1.003	-0.082	1.066	+0.369	2.099	+1.846
$D_{\delta} \alpha$, $D_{\alpha} \alpha$	+0.03	-0.01	+0.06	0.00	+0.07	0.00	+0.11	+0.02
$D_{\delta} \delta$, $D_{\alpha} \delta$	0.0	+1.0	0.0	+1.0	0.0	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ^2 Canis Majoris. Mag. 4.5		ϵ H. Camelop. Mag. 5.6		γ Geminorum. Mag. 1.9		δ Aurigæ. Mag. 5.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 31	° ' -22 53	h m 6 32	° ' +79 39	h m 6 32	° ' +16 28	h m 6 32	° ' +39 27
	s 61	" 53	s 62	" 39	s 61	" 28	s 61	" 27
Jan. 0.5	39.565	57.29	27.06	21.37	61.166	10.62	61.917	49.65
10.5	39.619 ⁵⁴	59.95 ²⁶⁶	27.25 ¹⁹	24.28 ²⁹¹	61.257 ⁹¹	10.13 ⁴⁹	62.025 ¹⁰⁶	50.59 ⁹⁴
20.4	39.623 ⁴	62.41 ²⁴⁶	27.18 ⁷	27.15 ²⁸⁷	61.298 ⁴¹	9.75 ³⁸	62.070 ⁴⁵	51.58 ⁹⁹
30.4	39.577 ⁴⁶	64.63 ²²²	26.88 ³⁰	29.86 ²⁷¹	61.287 ¹¹	9.49 ²⁶	62.054 ¹⁶	52.58 ¹⁰⁴
Feb. 9.4	39.484 ⁹³	66.56 ¹⁹³	26.34 ⁵⁴	32.30 ²⁴⁴	61.229 ⁵⁸	9.31 ¹⁸	61.979 ⁷⁵	53.52 ¹⁰⁰
	133	159	73	209	100	11	128	85
19.4	39.351	68.15	25.61	34.39	61.129	9.20	61.851	54.37
Mar. 1.3	39.185 ¹⁶⁶	69.39 ¹²⁴	24.71 ⁹⁰	36.04 ¹⁶⁵	60.994 ¹³⁵	9.14 ⁶	61.680 ¹⁷¹	55.05 ⁶⁶
11.3	38.995 ¹⁹⁰	70.25 ⁸⁶	23.68 ¹⁰³	37.18 ¹¹⁴	60.833 ¹⁶¹	9.12 ²	61.476 ²⁰⁴	55.56 ⁶¹
21.3	38.792 ²⁰³	70.75 ⁵⁰	22.58 ¹¹⁰	37.77 ⁸⁹	60.657 ¹⁷⁶	9.12 ⁰	61.255 ²²¹	55.84 ²⁸
31.2	38.585 ²⁰⁷	70.85 ¹⁰	21.46 ¹¹²	37.78 ¹	60.477 ¹⁸⁰	9.13 ¹	61.029 ²²⁶	55.89 ⁵
	200	25	109	55	173	2	218	19
Apr. 10.2	38.385	70.60	20.37	37.23	60.304	9.15	60.811	55.70
20.2	38.201 ¹³⁴	69.99 ⁶¹	19.36 ¹⁰¹	36.15 ¹⁰⁸	60.149 ¹⁵⁵	9.17 ²	60.612 ¹⁹⁹	55.30 ⁴⁰
30.2	38.041 ¹⁶⁰	69.04 ⁹⁵	18.45 ⁹¹	34.58 ¹⁵⁷	60.018 ¹³¹	9.20 ³	60.445 ¹⁶⁷	54.71 ⁸⁹
May 10.1	37.911 ¹³⁰	67.77 ¹²⁷	17.69 ⁷⁶	32.57 ²⁰¹	59.918 ¹⁰⁰	9.26 ⁶	60.317 ¹²⁸	53.93 ⁷⁸
20.1	37.816 ⁹⁵	66.21 ¹⁵⁶	17.11 ⁵⁶	30.21 ²³⁶	59.856 ⁶²	9.34 ⁸	60.234 ⁸³	53.02 ⁹¹
	55	181	39	265	23	13	34	101
30.1	37.761 ¹⁵	64.40 ²⁰²	16.72 ¹⁷	27.56 ²⁸⁴	59.833 ¹⁹	9.47 ¹⁶	60.200 ¹⁷	52.01 ¹⁰⁷
June 9.1	37.746 ²⁶	62.38 ²¹⁹	16.55 ³	24.72 ²⁹⁵	59.852 ⁵⁹	9.63 ²¹	60.217 ⁶⁸	50.94 ¹¹⁰
19.0	37.772 ⁶⁷	60.19 ²²⁹	16.58 ²⁴	21.77 ²⁹⁹	59.911 ⁹⁸	9.84 ²⁶	60.285 ¹¹⁷	49.84 ¹¹⁰
29.0	37.839 ¹⁰⁵	57.90 ²³²	16.82 ⁴⁵	18.78 ²⁹⁵	60.009 ¹³⁶	10.10 ²⁷	60.402 ¹⁶⁴	48.74 ¹⁰⁷
July 9.0	37.944 ¹⁴¹	55.58 ²²⁹	17.27 ⁶³	15.83 ²⁸⁵	60.145 ¹⁹⁹	10.37 ²⁸	60.566 ²⁰⁵	47.67 ¹⁰³
18.9	38.085	53.29	17.90	12.98	60.314	10.65	60.771	46.64
28.9	38.260 ¹⁷⁵	51.11 ²¹⁸	18.73 ⁸³	10.31 ²⁶⁷	60.513 ¹⁹⁹	10.93 ²⁸	61.014 ²⁴³	45.67 ⁹⁷
Aug. 7.9	38.464 ²⁰⁴	49.10 ²⁰¹	19.71 ⁹⁸	7.86 ²⁴⁵	60.738 ²²⁵	11.16 ²³	61.289 ²⁷⁵	44.78 ⁸⁹
17.9	38.694 ²³⁰	47.36 ¹⁷⁴	20.82 ¹¹¹	5.70 ²¹⁶	60.985 ²⁴⁷	11.35 ¹⁹	61.593 ³⁰⁴	43.97 ⁸¹
27.8	38.947 ²⁵³	45.93 ¹⁴³	22.06 ¹²⁴	3.86 ¹⁸⁴	61.251 ²⁶⁶	11.46 ¹¹	61.920 ³²⁷	43.24 ⁷³
	270	103	134	149	280	0	346	65
Sept. 6.8	39.217	44.90	23.40	2.37	61.531	11.46	62.266	42.59
16.8	39.502 ²⁸⁵	44.30 ⁶⁰	24.81 ¹⁴¹	1.27 ¹¹⁰	61.824 ²⁹³	11.34 ¹²	62.626 ³⁶⁰	42.03 ⁵⁴
26.8	39.796 ²⁹⁴	44.17 ¹³	26.27 ¹⁴⁶	0.59 ⁶⁸	62.125 ³⁰¹	11.07 ²⁷	62.997 ³⁷¹	41.56 ⁴⁷
Oct. 6.7	40.096 ³⁰⁰	44.54 ³⁷	27.75 ¹⁴⁸	0.33 ²⁶	62.432 ³⁰⁷	10.68 ³⁹	63.374 ³⁷⁷	41.19 ³⁷
16.7	40.396 ³⁰⁰	45.41 ⁸⁷	29.22 ¹⁴⁷	0.51 ¹⁸	62.740 ³⁰⁸	10.16 ⁵²	63.753 ³⁷⁹	40.94 ²¹
	295	133	145	63	304	64	375	1
26.7	40.691	46.74	30.67	1.14	63.044	9.52	64.128	40.80
Nov. 5.6	40.975 ²⁸⁴	48.51 ¹⁷⁷	32.03 ¹³⁶	2.21 ¹⁰⁷	63.342 ²⁹⁸	8.78 ⁷⁴	64.493 ³⁶⁵	40.79 ¹
15.6	41.241 ²⁶⁶	50.66 ²¹⁵	33.31 ¹²⁸	3.70 ¹⁴⁹	63.626 ²⁸⁴	8.00 ⁷⁸	64.841 ³⁴⁸	40.93 ¹
25.6	41.485 ²⁴⁴	53.09 ²⁴³	34.46 ¹¹⁵	5.58 ¹⁸⁸	63.890 ²⁶⁴	7.20 ⁸⁰	65.164 ³²³	41.24 ³
Dec. 5.6	41.696 ²¹¹	55.75 ²⁶⁶	35.45 ⁹⁹	7.83 ²²⁵	64.128 ²³⁸	6.42 ⁷⁸	65.453 ²⁹⁹	41.71 ⁴
	173	276	79	255	204	72	247	6
15.5	41.869	58.51	36.24	10.38	64.332	5.70	65.700	42.33
25.5	41.999 ¹³⁰	61.31 ²⁸⁰	36.81 ⁵⁷	13.13 ²⁷⁵	64.495 ¹⁶³	5.05 ⁶⁵	65.898 ¹⁹⁶	43.11 ⁷¹
35.5	42.081 ⁸²	64.04 ²⁷³	37.14 ³³	16.01 ²⁸⁸	64.614 ¹¹⁹	4.50 ⁵⁵	66.038 ¹⁴⁰	44.00 ⁸¹
Mean Place	37.202	54.58	15.866	22.49	58.530	13.15	58.694	51.81
Sec δ , Tan δ	1.086	-0.422	5.569	+5.479	1.043	+0.296	1.295	+0.823
$D\phi a$, $D\omega a$	+0.05	0.00	+0.20	+0.05	+0.07	0.00	+0.08	+0.01
$D\phi \delta$, $D\omega \delta$	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Argus. Mag. 3.2		S Monocerotis. Mag. 4.7		ε Geminorum. Mag. 3.2		ξ Geminorum. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 35	° ' " -43 7	h m 6 36	° ' " + 9 58	h m 6 38	° ' " +25 12	h m 6 40	° ' " +12 58
	s	"	s	"	s	"	s	"
Jan. 0.5	17.732	27.12	30.293	18.56	56.083	45.73	43.848	63.33
10.5	17.759	30.50	30.383	17.66	56.187	45.77	43.944	62.61
20.4	17.723	33.69	30.423	16.89	56.237	45.92	43.990	62.01
30.4	17.626	36.59	30.414	16.26	56.232	46.15	43.985	61.53
Feb. 9.4	17.476	39.13	30.358	15.76	56.176	46.41	43.933	61.16
19.4	17.278	41.27	30.261	15.38	56.075	46.69	43.839	60.91
Mar. 1.3	17.043	42.96	30.130	15.12	55.936	46.95	43.709	60.75
11.3	16.778	44.18	29.972	14.95	55.768	47.15	43.552	60.65
21.3	16.498	44.91	29.801	14.87	55.584	47.29	43.380	60.62
31.3	16.212	45.15	29.625	14.86	55.394	47.35	43.203	60.63
Apr. 10.2	15.934	44.90	29.456	14.93	55.209	47.33	43.031	60.68
20.2	15.673	44.18	29.301	15.06	55.042	47.22	42.875	60.77
30.2	15.437	43.00	29.171	15.28	54.900	47.03	42.741	60.90
May 10.1	15.236	41.41	29.070	15.57	54.792	46.79	42.638	61.09
20.1	15.076	39.43	29.006	15.93	54.722	46.52	42.571	61.32
30.1	14.960	37.13	28.979	16.36	54.693	46.22	42.542	61.60
June 9.1	14.894	34.54	28.992	16.87	54.708	45.91	42.553	61.94
19.0	14.877	31.76	29.045	17.43	54.765	45.61	42.602	62.33
29.0	14.911	28.83	29.135	18.05	54.865	45.33	42.690	62.75
July 9.0	14.994	25.85	29.261	18.69	55.002	45.07	42.815	63.20
19.0	15.124	22.91	29.420	19.33	55.176	44.82	42.974	63.65
28.9	15.299	20.09	29.608	19.94	55.383	44.60	43.161	64.08
Aug. 7.9	15.516	17.49	29.823	20.50	55.616	44.37	43.375	64.46
17.9	15.769	15.21	30.059	20.96	55.874	44.13	43.611	64.76
27.8	16.054	13.30	30.314	21.29	56.152	43.87	43.867	64.95
Sept. 6.8	16.366	11.88	30.584	21.46	56.447	43.58	44.139	65.01
16.8	16.699	10.99	30.865	21.45	56.756	43.24	44.423	64.92
26.8	17.047	10.68	31.157	21.24	57.074	42.86	44.717	64.65
Oct. 6.7	17.401	10.98	31.454	20.83	57.399	42.42	45.017	64.21
16.7	17.754	11.90	31.753	20.23	57.726	41.95	45.320	63.61
26.7	18.100	13.40	32.050	19.44	58.051	41.46	45.622	62.85
Nov. 5.7	18.429	15.45	32.340	18.50	58.370	40.96	45.917	61.98
15.6	18.732	17.98	32.617	17.45	58.674	40.49	46.201	61.02
25.6	19.001	20.92	32.875	16.33	58.959	40.07	46.465	60.01
Dec. 5.6	19.228	24.14	33.108	15.18	59.216	39.73	46.704	59.00
15.5	19.406	27.55	33.307	14.06	59.438	39.50	46.910	58.03
25.5	19.527	31.04	33.467	13.00	59.618	39.37	47.077	57.13
35.5	19.589	34.49	33.582	12.03	59.750	39.35	47.199	56.34
Mean Place	15.219	24.66	27.750	21.33	53.282	48.55	41.265	66.30
Sec δ, Tan δ	1.370	-0.937	1.015	+0.176	1.105	+0.471	1.026	+0.231
D _ψ α, D _ω α	+0.04	-0.01	+0.07	0.00	+0.07	+0.01	+0.07	0.00
D _ψ δ, D _ω δ	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ^5 Aurigæ. Mag. 5.3		α Canis Majoris. (Sirius.) Mag. -1.6		18 Monocerotis. Mag. 4.7		43 Camelop. Mag. 5.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 40	° ' " +43 39	h m 6 41	° ' " -16 36	h m 6 43	° ' " + 2 30	h m 6 44	° ' " +68 58
	s 60	" 30	s 60	" 36	s 60	" 30	s 60	" 58
Jan. 0.5	53.346 123	34.52 118	34.298 66	13.94 243	37.553 91	7.36 137	58.39 18	65.52 248
10.5	53.469 56	35.70 124	34.364 18	16.37 226	37.644 42	5.99 122	58.57 5	68.00 230
20.4	53.525 11	36.94 124	34.382 34	18.63 201	37.686 7	4.77 106	58.62 8	70.50 223
30.4	53.514 74	38.18 117	34.348 78	20.64 174	37.679 53	3.71 88	58.54 21	72.92 128
Feb. 9.4	53.440 131	39.35 106	34.270 119	22.38 146	37.626 94	2.83 69	58.33 30	75.14 212
19.4	53.309 179	40.41 88	34.151 152	23.84 112	37.532 129	2.14 53	58.03 40	77.10 190
Mar. 1.3	53.130 214	41.29 66	33.999 176	24.96 80	37.403 153	1.61 36	57.63 47	78.70 117
11.3	52.916 236	41.95 42	33.823 190	25.76 48	37.250 171	1.25 19	57.16 52	79.87 71
21.3	52.680 243	42.37 13	33.633 194	26.24 15	37.079 175	1.06 4	56.64 53	80.58 21
31.3	52.437 237	42.50 15	33.439 190	26.39 18	36.904 170	1.02 10	56.11 53	80.79 28
Apr. 10.2	52.200 217	42.35 40	33.249 173	26.21 47	36.734 157	1.12 25	55.58 49	80.51 77
20.2	51.983 188	41.95 65	33.076 151	25.74 78	36.577 135	1.37 39	55.09 44	79.74 121
30.2	51.795 146	41.30 85	32.925 122	24.96 106	36.442 105	1.76 52	54.65 36	78.53 100
May 10.1	51.649 100	40.45 104	32.803 87	23.90 130	36.337 71	2.28 64	54.29 27	76.93 194
20.1	51.549 49	39.41 119	32.716 51	22.60 152	36.266 35	2.92 78	54.02 19	74.99 222
30.1	51.500 6	38.22 127	32.665 11	21.08 172	36.231 3	3.70 87	53.83 7	72.77 240
June 9.1	51.506 59	36.95 133	32.654 29	19.36 186	36.234 40	4.57 95	53.76 3	70.37 255
19.0	51.565 111	35.62 133	32.683 67	17.50 195	36.274 79	5.52 101	53.79 13	67.82 259
29.0	51.676 161	34.27 133	32.750 104	15.55 198	36.353 114	6.53 104	53.92 24	65.23 258
July 9.0	51.837 207	32.94 129	32.854 138	13.57 195	36.467 145	7.57 103	54.16 34	62.65 252
19.0	52.044 247	31.65 121	32.992 171	11.62 186	36.612 176	8.60 99	54.50 42	60.13 244
28.9	52.291 283	30.44 113	33.163 198	9.76 170	36.788 203	9.59 90	54.92 49	57.73 222
Aug. 7.9	52.574 314	29.31 105	33.361 223	8.06 148	36.991 224	10.49 76	55.41 57	55.51 20
17.9	52.888 340	28.26 95	33.584 244	6.58 118	37.215 243	11.25 59	55.98 63	53.50 17
27.8	53.228 362	27.31 84	33.828 263	5.40 84	37.458 261	11.84 37	56.61 68	51.74 14
Sept. 6.8	53.590 379	26.47 70	34.091 275	4.56 45	37.719 274	12.21 12	57.29 73	50.26 11
16.8	53.969 392	25.77 58	34.366 285	4.11 1	37.993 283	12.33 14	58.02 75	49.10 8
26.8	54.361 401	25.19 45	34.651 292	4.10 43	38.276 290	12.19 41	58.77 76	48.27 4
Oct. 6.7	54.762 403	24.74 29	35.423 293	4.53 88	38.566 294	11.78 70	59.53 77	47.79 1
16.7	55.165 398	24.45 13	35.236 291	5.41 130	38.860 292	11.08 94	60.30 75	47.69 2
26.7	55.563 390	24.32 4	35.527 281	6.71 169	39.152 286	10.14 118	61.05 73	47.97 6
Nov. 5.7	55.953 373	24.36 24	35.808 265	8.40 202	39.438 275	8.96 135	61.78 69	48.64 10
15.6	56.326 347	24.60 42	36.073 244	10.42 228	39.713 254	7.61 147	62.47 64	49.69 1
25.6	56.673 313	25.02 63	36.317 215	12.70 246	39.967 231	6.14 155	63.11 57	51.09 1
Dec. 5.6	56.986 269	25.65 82	36.532 179	15.16 256	40.198 198	4.59 157	63.68 47	52.84 2
15.5	57.255 217	26.47 99	36.711 140	17.72 257	40.396 160	3.02 153	64.15 37	54.89 2
25.5	57.472 156	27.46 112	36.851 93	20.29 250	40.556 116	1.49 143	64.52 24	57.16 2
35.5	57.628	28.58	36.944	22.79	40.672	0.06	64.76	59.60
Mean Place	49.950	37.31	32.077	10.21	35.091	10.40	52.337	68.34
Sec δ , Tan δ	1.382	+0.954	1.044	-0.298	1.001	+0.044	2.788	+2.603
$D\psi\alpha$, $D\psi\delta$	+0.09	+0.01	+0.05	0.00	+0.06	0.00	+0.13	+0.03
$D\delta\alpha$, $D\delta\delta$	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington at Time.	α Pictoris. Mag. 3.3		θ Geminorum. Mag. 3.6		τ Argus. Mag. 2.8		15 Lynx. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 47	° ' " -61 50	h m 6 47	° ' " +34 3	h m 6 47	° ' " -50 30	h m 6 50	° ' " +58 31
n. 0.5	24.21	73.32	26.233	37.44	56.738	62.45	15.434	51.10
10.5	24.20	77.05	26.353	38.02	56.765	66.06	15.591	53.08
20.5	24.08	80.60	26.415	38.69	56.721	69.47	15.660	55.10
30.4	23.89	83.89	26.417	39.42	56.609	72.62	15.636	57.09
b. 9.4	23.61	86.83	26.362	40.15	56.436	75.44	15.525	58.96
19.4	23.27	89.35	26.257	40.82	56.207	77.84	15.336	60.62
ur. 1.3	22.87	91.41	26.109	41.42	55.934	79.79	15.082	62.02
11.3	22.43	92.97	25.929	41.91	55.627	81.25	14.777	63.06
21.3	21.96	94.00	25.729	42.23	55.299	82.21	14.440	63.72
31.3	21.48	94.48	25.521	42.37	54.963	82.64	14.090	63.98
or. 10.2	21.01	94.43	25.317	42.34	54.630	82.57	13.744	63.83
20.2	20.55	93.87	25.129	42.12	54.313	81.99	13.420	63.27
30.2	20.13	92.79	24.968	41.76	54.022	80.93	13.134	62.34
ay 10.2	19.75	91.24	24.842	41.25	53.766	79.41	12.900	61.06
20.1	19.42	89.24	24.756	40.63	53.553	77.48	12.725	59.50
30.1	19.15	86.87	24.714	39.91	53.388	75.19	12.619	57.72
ne 9.1	18.95	84.16	24.718	39.14	53.275	72.58	12.584	55.76
19.0	18.83	81.19	24.769	38.33	53.218	69.74	12.623	53.67
29.0	18.79	78.04	24.866	37.52	53.218	66.72	12.732	51.54
ly 9.0	18.82	74.81	25.004	36.71	53.273	63.63	12.911	49.40
19.0	18.93	71.58	25.182	35.92	53.386	60.56	13.155	47.31
28.9	19.10	68.46	25.397	35.16	53.550	57.58	13.458	45.30
ig. 7.9	19.35	65.53	25.643	34.43	53.765	54.79	13.815	43.41
17.9	19.67	62.91	25.915	33.74	54.026	52.31	14.218	41.68
27.9	20.04	60.69	26.212	33.08	54.327	50.22	14.661	40.15
pt. 6.8	20.47	58.95	26.527	32.45	54.662	48.60	15.138	38.81
16.8	20.94	57.76	26.858	31.85	55.026	47.52	15.643	37.72
26.8	21.43	57.19	27.202	31.29	55.409	47.04	16.166	36.87
t. 6.7	21.94	57.28	27.555	30.77	55.804	47.18	16.704	36.30
16.7	22.45	58.02	27.911	30.30	56.201	47.96	17.247	36.02
26.7	22.94	59.42	28.267	29.90	56.591	49.38	17.786	36.03
iv. 5.7	23.41	61.43	28.615	29.59	56.964	51.38	18.314	36.36
15.6	23.83	63.99	28.951	29.40	57.307	53.91	18.817	37.01
25.6	24.20	67.01	29.266	29.33	57.612	56.88	19.286	37.97
sc. 5.6	24.50	70.40	29.553	29.40	57.869	60.18	19.705	39.22
15.6	24.72	74.03	29.801	29.63	58.070	63.73	20.065	40.75
25.6	24.86	77.79	30.004	30.01	58.205	67.38	20.353	42.50
35.5	24.90	81.56	30.155	30.52	58.274	71.04	20.559	44.41
Place	21.093	71.78	23.203	40.85	54.073	60.59	11.009	54.66
l, Tan δ	2.120	-1.869	1.207	+0.676	1.573	-1.214	1.916	+1.634
D _a α	+0.01	-0.03	+0.08	+0.01	+0.03	-0.02	+0.10	+0.02
D _a β	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Canis Majoris. Mag. 4.2		ϵ Canis Majoris. Mag. 1.6		ζ Geminorum. Var. 3.7-4.3		σ^2 Canis Majoris. Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 50	" -11 55	h m 6 55	" -28 51	h m 6 59	" +20 41	h m 6 59	" -23 42
Jan. 0.5	25.209 ⁸⁴	68.56 ²²⁰	26.556 ⁷³	37.27 ²⁹⁹	17.507 ¹²¹	25.82 ²⁹	38.387 ⁸³	47.98 ²⁸⁰
10.5	25.293 ³⁶	70.76 ²⁰³	26.629 ¹⁹	40.26 ²⁸⁴	17.628 ⁶⁸	25.53 ¹⁵	38.470 ³¹	50.78 ²⁶²
20.5	25.329 ¹⁴	72.79 ¹⁸³	26.648 ³⁴	43.10 ²⁵⁸	17.696 ¹⁵	25.38 ⁵	38.501 ¹⁹	53.40 ²⁴¹
30.4	25.315 ⁶⁰	74.62 ¹⁵⁷	26.614 ⁸⁴	45.68 ²²⁹	17.711 ³⁶	25.33 ¹²	38.482 ⁶⁹	55.81 ²¹²
Feb. 9.4	25.255 ¹⁰²	76.19 ¹³²	26.530 ¹²⁸	47.97 ¹⁹⁴	17.675 ⁸²	25.38 ¹²	38.413 ¹¹⁴	57.93 ¹⁷⁹
19.4	25.153 ¹³⁵	77.51 ¹⁰³	26.402 ¹⁶⁶	49.91 ¹⁵⁷	17.593 ¹²³	25.50 ¹⁵	38.299 ¹⁵⁰	59.72 ¹⁴⁶
Mar. 1.3	25.018 ¹⁶³	78.54 ⁷⁴	26.236 ¹⁹⁴	51.48 ¹¹⁷	17.470 ¹⁵³	25.65 ¹⁷	38.149 ¹⁷⁸	61.18 ¹⁰⁹
11.3	24.855 ¹⁷⁹	79.28 ⁴⁵	26.042 ²¹²	52.65 ⁷⁷	17.317 ¹⁷³	25.82 ¹⁵	37.971 ¹⁹⁶	62.27 ⁷⁰
21.3	24.676 ¹⁸⁵	79.73 ¹⁶	25.830 ²²⁰	53.42 ³⁴	17.144 ¹⁸¹	25.97 ¹²	37.775 ²⁰⁴	62.97 ³³
31.3	24.491 ¹⁸²	79.89 ¹²	25.610 ²¹⁷	53.76 ⁶	16.963 ¹⁷⁹	26.09 ⁹	37.571 ²⁰³	63.30 ³
Apr. 10.2	24.309 ¹⁶⁸	79.77 ³⁸	25.393 ²⁰⁴	53.70 ⁴⁵	16.784 ¹⁶⁶	26.18 ⁴	37.368 ¹⁹²	63.27 ⁴¹
20.2	24.141 ¹⁴⁹	79.39 ⁶⁶	25.189 ¹⁸⁵	53.25 ⁸⁵	16.618 ¹⁴⁵	26.22 ⁰	37.176 ¹⁷²	62.86 ⁷⁷
30.2	23.992 ¹²⁰	78.73 ⁸⁹	25.004 ¹⁵⁶	52.40 ¹²¹	16.473 ¹¹⁶	26.22 ³	37.004 ¹⁴⁶	62.09 ¹⁰⁹
May 10.2	23.872 ⁸⁹	77.84 ¹¹³	24.848 ¹²³	51.19 ¹⁵⁵	16.357 ⁸²	26.19 ⁶	36.858 ¹¹³	61.00 ¹³⁹
20.1	23.783 ⁵³	76.71 ¹³³	24.725 ⁸⁶	49.64 ¹⁸³	16.275 ⁴⁴	26.13 ⁶	36.745 ⁷⁸	59.61 ¹⁶⁵
30.1	23.730 ¹⁵	75.38 ¹⁵⁰	24.639 ⁴⁷	47.81 ²⁰⁹	16.231 ⁴	26.07 ⁷	36.667 ³⁹	57.93 ¹⁸⁹
June 9.1	23.715 ²³	73.88 ¹⁶⁵	24.592 ⁵	45.72 ²²⁹	16.227 ³⁷	26.00 ⁶	36.628 ¹	56.04 ²⁰⁸
19.0	23.738 ⁹⁰	72.23 ¹⁷³	24.587 ³⁷	43.43 ²⁴²	16.264 ⁷⁶	25.94 ⁶	36.627 ³⁹	53.96 ²²²
29.0	23.798 ⁶⁵	70.50 ¹⁷⁸	24.624 ⁷⁶	41.01 ²⁴⁹	16.340 ¹¹⁴	25.88 ⁶	36.666 ⁷⁸	51.74 ²²⁷
July 9.0	23.893 ¹³⁰	68.72 ¹⁷⁷	24.700 ¹¹⁵	38.52 ²⁴⁸	16.454 ¹⁴⁹	25.82 ⁶	36.744 ¹¹⁴	49.47 ²²⁸
19.0	24.023 ¹⁶¹	66.95 ¹⁶⁸	24.815 ¹⁵²	36.04 ²⁴⁰	16.603 ¹⁷⁹	25.76 ⁶	36.858 ¹⁴⁹	47.19 ²²⁰
28.9	24.184 ¹⁸⁸	65.27 ¹⁵⁶	24.967 ¹⁸⁴	33.64 ²²³	16.782 ²⁰⁹	25.70 ¹⁰	37.007 ¹⁸⁰	44.99 ²⁰⁴
Aug. 7.9	24.372 ²¹⁴	63.71 ¹³⁷	25.151 ²¹⁵	31.41 ¹⁹⁸	16.991 ²³³	25.60 ¹⁵	37.187 ²⁰⁹	42.95 ¹³²
17.9	24.586 ²³⁵	62.34 ¹¹⁰	25.366 ²⁴¹	29.43 ¹⁶⁶	17.224 ²⁵⁵	25.45 ²¹	37.396 ²³³	41.13 ¹⁵¹
27.9	24.821 ²⁵⁵	61.24 ⁷⁹	25.607 ²⁶⁶	27.77 ¹²⁶	17.479 ²⁷⁴	25.24 ²⁸	37.629 ²⁵⁷	39.62 ¹¹⁴
Sept. 6.8	25.076 ²⁶⁸	60.45 ⁴⁶	25.873 ²⁸⁴	26.51 ⁸¹	17.753 ²⁸⁹	24.96 ³⁸	37.886 ²⁷⁵	38.48 ⁷³
16.8	25.344 ²⁸⁰	59.99 ⁵	26.157 ³⁰⁰	25.70 ³¹	18.042 ³⁰³	24.58 ⁴⁷	38.161 ²⁸⁹	37.75 ²⁵
26.8	25.624 ²⁸⁹	59.94 ³⁵	26.457 ³⁰⁹	25.39 ²²	18.345 ³¹²	24.11 ⁵⁷	38.450 ²⁹⁹	37.50 ²⁴
Oct. 6.7	25.913 ²⁹³	60.29 ⁷⁷	26.766 ³¹⁴	25.61 ⁷⁷	18.657 ³¹⁸	23.54 ⁶⁸	38.749 ³⁰⁵	37.74 ⁷⁴
16.7	26.206 ²⁹²	61.06 ¹¹⁵	27.080 ³¹²	26.38 ¹²⁸	18.975 ³¹⁹	22.88 ⁷³	39.054 ³⁰⁴	38.48 ¹²³
26.7	26.498 ²⁸⁶	62.21 ¹⁵¹	27.392 ³⁰⁴	27.66 ¹⁷⁷	19.294 ³¹⁶	22.15 ⁷⁷	39.358 ²⁹⁹	39.71 ¹⁶⁹
Nov. 5.7	26.784 ²⁷⁴	63.72 ¹⁸¹	27.696 ²⁸⁹	29.43 ²²⁰	19.610 ³⁰⁶	21.38 ⁷⁹	39.657 ²⁸⁵	41.40 ²⁰⁸
15.6	27.058 ²⁵⁴	65.53 ²⁰⁶	27.985 ²⁶⁶	31.63 ²⁵⁶	19.916 ²⁹⁰	20.59 ⁷⁶	39.942 ²⁶⁴	43.48 ²⁴¹
25.6	27.312 ²²⁸	67.59 ²²²	28.251 ²³⁶	34.19 ²⁸²	20.206 ²⁶⁵	19.83 ⁶⁸	40.206 ²³⁷	45.89 ²⁶⁷
Dec. 5.6	27.540 ¹⁹⁵	69.81 ²³²	28.487 ¹⁹⁷	37.01 ²⁹⁹	20.471 ²³⁴	19.15 ⁶¹	40.443 ²⁰¹	48.56 ²⁸¹
15.6	27.735 ¹⁵⁶	72.13 ²³²	28.684 ¹⁵²	40.00 ³⁰⁸	20.705 ¹⁹³	18.54 ⁵⁰	40.644 ¹⁵⁹	51.37 ²⁸⁸
25.5	27.891 ¹¹⁰	74.45 ²²⁶	28.836 ¹⁰³	43.08 ³⁰⁴	20.898 ¹⁴⁸	18.04 ³⁷	40.803 ¹¹²	54.25 ²⁸⁵
35.5	28.001 ¹¹⁰	76.71 ²²⁶	28.939 ¹⁰³	46.12 ³⁰⁴	21.046 ¹⁴⁸	17.67 ³⁷	40.915 ¹¹²	57.10 ²⁸⁵
Mean Place	22.836	65.62	24.174	34.89	14.808	29.92	36.025	45.43
Sec δ , Tan δ	1.022	-0.211	1.142	-0.551	1.069	+0.378	1.092	-0.439
$D\phi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.05	-0.01	+0.07	+0.01	+0.05	-0.01
$D\phi\delta$, $D\omega\delta$	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	γ Canis Majoris. Mag. 4.1		δ Canis Majoris. Mag. 2.0		63 Aurigæ. Mag. 5.1		51 Geminorum. Mag. 5.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 0	" ' s -15 30	h m 7 5	" ' s -26 15	h m 7 6	" ' s +39 27	h m 7 8	" ' s +16 17
a. 0.5	5.296 91	43.37 241	5.737 86	46.37 292	4.319 149	14.98 87	42.479 126	52.53 60
10.5	5.387 42	45.78 226	5.823 34	49.29 277	4.468 85	15.85 98	42.605 75	51.93 46
20.5	5.429 9	48.04 203	5.857 19	52.06 253	4.553 22	16.83 104	42.680 23	51.47 32
30.4	5.420 56	50.07 179	5.838 69	54.59 226	4.575 41	17.87 105	42.703 27	51.15 18
b. 9.4	5.364 98	51.86 149	5.769 114	56.85 192	4.534 98	18.92 101	42.676 73	50.97 9
19.4	5.266 135	53.35 89	5.655 153	58.77 156	4.436 146	19.93 89	42.603 115	50.88 0
ur. 1.4	5.131 163	54.54 56	5.502 181	60.33 119	4.290 184	20.82 74	42.488 142	50.88 6
11.3	4.968 181	55.43 25	5.321 200	61.52 80	4.106 211	21.56 55	42.346 165	50.94 9
21.3	4.787 188	55.99 6	5.121 210	62.32 40	3.895 222	22.11 32	42.181 175	51.03 11
31.3	4.599 186	56.24 37	4.911 209	62.72 2	3.673 221	22.43 9	42.006 175	51.14 12
ur. 10.2	4.413 176	56.18 37	4.702 199	62.74 37	3.452 208	22.52 15	41.831 163	51.26 12
20.2	4.237 156	55.81 66	4.503 180	62.37 75	3.244 186	22.37 37	41.668 145	51.38 11
30.2	4.081 129	55.15 93	4.323 153	61.62 109	3.058 151	22.00 57	41.523 118	51.49 12
ly 10.2	3.952 99	54.22 140	4.170 122	60.53 171	2.907 67	21.43 90	41.405 51	51.61 13
20.1	3.853 27	53.03 161	4.048 87	59.12 195	2.796 18	20.68 101	41.319 12	51.73 15
30.1	3.789 11	51.63 176	3.961 9	57.41 216	2.729 30	19.78 109	41.268 28	51.86 17
ne 9.1	3.762 47	50.02 187	3.912 30	55.46 228	2.711 77	18.77 114	41.256 66	52.01 17
19.1	3.773 85	48.26 191	3.903 70	53.30 236	2.741 124	17.68 118	41.284 102	52.18 18
29.0	3.820 119	46.39 192	3.933 107	51.02 237	2.818 166	16.54 116	41.350 133	52.35 16
ly 9.0	3.905 151	44.48 185	4.003 142	48.66 230	2.942 206	15.36 115	41.452 166	52.53 14
19.0	4.024 179	42.56 170	4.110 175	46.29 213	3.108 240	14.20 112	41.585 194	52.69 10
28.9	4.175 207	40.71 150	4.252 206	43.99 192	3.314 273	13.05 108	41.751 221	52.83 4
ig. 7.9	4.354 230	39.01 124	4.427 231	41.86 161	3.554 301	11.93 103	41.945 241	52.93 7
17.9	4.561 250	37.51 92	4.633 256	39.94 123	3.827 323	10.85 97	42.166 261	52.97 20
27.9	4.791 267	36.27 53	4.864 275	38.33 80	4.128 344	9.82 90	42.407 277	52.90 31
pt. 6.8	5.041 280	35.35 13	5.120 291	37.10 32	4.451 359	8.85 82	42.668 291	52.70 45
16.8	5.308 291	34.82 31	5.395 304	36.30 19	4.795 372	7.95 73	42.945 303	52.39 59
26.8	5.588 296	34.69 75	5.686 309	35.98 71	5.154 383	7.13 63	43.236 313	51.94 85
t. 6.8	5.879 296	35.00 117	5.990 311	36.17 122	5.526 383	6.40 50	43.539 313	51.35 85
16.7	6.175 292	35.75 156	6.299 304	36.88 169	5.906 379	5.77 36	43.848 310	50.61 93
26.7	6.471 281	36.92 190	6.610 292	38.10 212	6.289 369	5.27 17	44.161 302	49.76 99
ur. 5.7	6.763 261	38.48 218	6.914 271	39.79 247	6.668 348	4.91 0	44.471 288	48.83 100
15.6	7.044 236	40.38 236	7.206 242	41.91 273	7.037 283	4.74 41	44.773 264	47.84 98
25.6	7.305 203	42.56 248	7.477 207	44.38 290	7.385 235	4.74 78	45.061 153	46.84 67
sc. 5.6	7.541 163	44.92 252	7.719 164	47.11 298	7.705 181	4.95 60	45.325 196	45.86 80
15.6	7.744 118	47.40 248	7.926 115	50.01 297	7.988 235	5.36 78	45.562 153	44.95 80
25.5	7.907 163	49.92 252	8.090 164	52.99 298	8.223 181	5.96 78	45.758 153	44.15 80
35.5	8.025 118	52.40 248	8.205 115	55.96 297	8.404 181	6.74 78	45.911 153	43.48 67
Place	2.934	40.48	3.369	43.98	1.123	20.00	39.865	57.02
tan δ	1.038	-0.278	1.115	-0.494	1.295	+0.823	1.042	+0.292
D_{α}	+0.05	0.00	+0.05	-0.01	+0.08	+0.02	+0.08	+0.01
D_{δ}	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ^2 Volantis. Mag. 3.9			λ Geminorum. Mag. 3.6			π Argus. Mag. 2.7			δ Geminorum. Mag. 3.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 7 9	s	° ' "	h m 7 13	s	° ' "	h m 7 14	s	° ' "	h m 7 15	s	° ' "
			-70 21			+16 41			-36 56			+22 7
Jan. 0.5	30.63		57.71	25.538		16.69	17.231		60.97	16.381		58.76
10.5	30.63	0	61.53	25.669	131	16.10	17.317	86	64.31	16.519	138	58.51
20.5	30.49	14	65.24	25.749	80	15.66	17.344	27	67.51	16.604	85	58.41
30.4	30.23	26	68.74	25.777	28	15.36	17.314	30	70.49	16.636	32	58.44
Feb. 9.4	29.86	37	71.93	25.753	24	15.20	17.229	85	73.18	16.614	22	58.57
		47			70			135			71	
19.4	29.39		74.77	25.683		15.13	17.094		75.52	16.543		58.78
Mar. 1.4	28.83	56	77.17	25.572	111	15.15	16.917	177	77.46	16.431	112	59.04
11.3	28.22	61	79.09	25.430	142	15.23	16.707	210	78.98	16.286	145	59.30
21.3	27.56	66	80.49	25.266	164	15.34	16.475	232	80.05	16.117	169	59.54
31.3	26.88	68	81.38	25.092	174	15.47	16.231	244	80.67	15.937	180	59.74
		69			175			245			181	
Apr. 10.3	26.19		81.73	24.917		15.60	15.986		80.84	15.756		59.89
20.2	25.51	68	81.54	24.753	164	15.72	15.750	236	80.55	15.586	170	59.98
30.2	24.87	64	80.84	24.606	147	15.84	15.533	217	79.83	15.434	152	60.01
May 10.2	24.27	60	79.62	24.485	121	15.95	15.340	193	78.69	15.309	125	59.98
20.1	23.74	53	77.94	24.396	89	16.07	15.180	160	77.17	15.216	93	59.91
		45			52			123			56	
30.1	23.29	37	75.83	24.344		16.19	15.057		75.30	15.160		59.80
June 9.1	22.92	37	73.35	24.328	16	16.32	14.975	82	73.14	15.143	17	59.66
19.1	22.65	27	70.57	24.351	23	16.46	14.934	41	70.73	15.165	22	59.51
29.0	22.48	17	67.55	24.412	61	16.60	14.937	3	68.13	15.226	61	59.34
July 9.0	22.41	7	64.39	24.507	95	16.75	14.983	46	65.43	15.324	98	59.16
		5			131			90			134	
19.0	22.46		61.17	24.638		16.88	15.073		62.71	15.458		58.97
29.0	22.61	15	57.99	24.801	163	16.98	15.203	130	60.05	15.625	167	58.74
Aug. 7.9	22.87	26	54.97	24.990	189	17.04	15.372	169	57.54	15.820	195	58.49
17.9	23.22	35	52.18	25.207	217	17.02	15.578	206	55.26	16.043	223	58.19
27.9	23.67	45	49.75	25.445	238	16.91	15.815	237	53.30	16.288	245	57.83
		54			259			268			267	
Sept. 6.8	24.21		47.75	25.704		16.68	16.083		51.75	16.555		57.40
16.8	24.81	60	46.27	25.979	275	16.33	16.375	262	50.68	16.839	284	56.88
26.8	25.46	65	45.40	26.269	290	15.84	16.688	313	50.13	17.139	300	56.27
Oct. 6.8	26.14	68	45.16	26.571	302	15.22	17.016	328	50.16	17.451	312	55.57
16.7	26.84	70	45.59	26.881	310	14.45	17.352	336	50.76	17.771	320	54.81
		68			313			338			324	
26.7	27.52		46.67	27.194		13.58	17.690		51.93	18.095		53.99
Nov. 5.7	28.17	65	48.39	27.507	313	12.63	18.022	332	53.66	18.419	324	53.14
15.7	28.77	60	50.70	27.812	305	11.62	18.339	317	55.89	18.736	317	52.30
25.6	29.29	52	53.52	28.104	292	10.61	18.632	298	58.54	19.038	302	51.50
Dec. 5.6	29.72	43	56.77	28.373	269	9.63	18.893	261	61.52	19.318	280	50.79
		33			239			221			249	
15.6	30.05		60.33	28.612		8.73	19.114		64.73	19.567		50.17
25.5	30.24	19	64.08	28.814	202	7.93	19.287	173	68.08	19.778	211	49.69
35.5	30.32	8	67.90	28.972	158	7.27	19.406	119	71.44	19.944	166	49.35
Mean Place	26.778		57.60	22.922		21.45	14.799		59.34	13.672		63.88
Sec δ , Tan δ	2.976		-2.803	1.044		+0.300	1.251		-0.752	1.080		+0.407
$D\mu a$, $D\mu a$	-0.01		-0.06	+0.07		+0.01	+0.04		-0.02	+0.07		+0.01
$\mu \delta$, $D\mu \delta$	-0.1		+1.0	-0.1		+0.9	-0.1		+0.9	-0.1		+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Volantis. Mag. 4.0		ϵ Geminorum. Mag. 3.9		γ Canis Majoris. Mag. 2.4		Groombridge 1308. Mag. 5.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 16	° ' -67 48	h m 7 20	° ' +27 57	h m 7 20	° ' -29 8	h m 7 22	° ' +68 37
	s 7 16	" -67 48	s 7 20	" +27 57	s 7 20	" -29 8	s 7 22	" +68 37
Jan. 0.5	56.50	25.77	40.993	38.05	53.511	34.56	27.63	58.80
10.5	56.52	29.61	41.144	38.15	53.614	37.63	27.90	61.17
20.5	56.43	33.36	41.237	38.41	53.660	40.58	28.05	63.64
30.4	56.24	36.91	41.275	38.78	53.654	43.31	28.07	66.14
Feb. 9.4	55.94	40.19	41.258	39.24	53.595	45.76	27.95	68.55
19.4	55.55	43.09	41.188	39.74	53.488	47.89	27.72	70.76
Mar. 1.4	55.07	45.57	41.074	40.25	53.342	49.66	27.39	72.70
11.3	54.55	47.59	40.925	40.73	53.163	51.05	26.98	74.27
21.3	53.98	49.10	40.749	41.13	52.963	52.03	26.50	75.42
31.3	53.38	50.08	40.561	41.44	52.749	52.60	25.99	76.10
Apr. 10.3	52.78	50.52	40.371	41.62	52.533	52.76	25.47	76.29
20.2	52.19	50.44	40.190	41.68	52.326	52.53	24.97	75.99
30.2	51.62	49.82	40.028	41.63	52.135	51.89	24.50	75.21
May 10.2	51.09	48.70	39.892	41.47	51.967	50.88	24.08	73.99
20.1	50.63	47.10	39.791	41.19	51.828	49.53	23.74	72.37
30.1	50.23	45.06	39.727	40.84	51.724	47.87	23.49	70.42
June 9.1	49.90	42.64	39.702	40.42	51.657	45.94	23.33	68.19
19.1	49.65	39.91	39.719	39.95	51.629	43.78	23.27	65.76
29.0	49.50	36.93	39.777	39.44	51.641	41.47	23.30	63.18
July 9.0	49.43	33.79	39.873	38.91	51.691	39.06	23.44	60.52
19.0	49.48	30.59	40.008	38.35	51.781	36.61	23.67	57.85
29.0	49.61	27.40	40.176	37.77	51.908	34.22	24.00	55.22
Aug. 7.9	49.83	24.36	40.376	37.17	52.069	31.97	24.40	52.69
17.9	50.14	21.54	40.603	36.55	52.261	29.93	24.88	50.31
27.9	50.54	19.07	40.856	35.90	52.483	28.19	25.43	48.12
Sept. 6.8	51.01	17.02	41.131	35.20	52.733	26.81	26.04	46.15
16.8	51.54	15.49	41.426	34.47	53.004	25.87	26.69	44.46
26.8	52.12	14.55	41.737	33.70	53.295	25.41	27.39	43.06
Oct. 6.8	52.74	14.23	42.061	32.91	53.602	25.49	28.13	42.01
16.7	53.36	14.58	42.395	32.11	53.917	26.10	28.88	41.32
26.7	53.98	15.60	42.735	31.31	54.235	27.23	29.63	41.01
Nov. 5.7	54.58	17.25	43.075	30.54	54.551	28.87	30.38	41.11
15.7	55.14	19.50	43.408	29.85	54.855	30.97	31.10	41.62
25.6	55.63	22.28	43.728	29.25	55.141	33.45	31.79	42.53
Dec. 5.6	56.03	25.60	44.024	28.77	55.399	36.23	32.41	43.85
15.6	56.35	29.04	44.288	28.44	55.623	39.22	32.96	45.54
25.5	56.57	32.78	44.514	28.29	55.802	42.32	33.41	47.55
35.5	56.67	36.62	44.692	28.29	55.934	45.43	33.75	49.80
Mean Place	52.938	25.94	38.168	43.81	51.144	32.53	21.784	65.80
Sec δ , Tan δ	2.648	-2.451	1.132	+0.531	1.145	-0.558	2.745	+2.556
$D_{\delta} \alpha$, $D_{\alpha} \alpha$	0.00	-0.05	+0.07	+0.01	+0.05	-0.01	+0.13	+0.06
$D_{\delta} \delta$, $D_{\alpha} \delta$	-0.1	+0.9	-0.1	+0.9	-0.1	+0.9	-0.1	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Canis Minoris. Mag. 3.1		ρ Geminorum. Mag. 4.2		σ Argus. Mag. 3.3		α^2 Geminorum. (Castor.) Mag. 2.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 22	° ' " + 8 27	h m 7 23	° ' " +31 56	h m 7 26	° ' " -43 7	h m 7 29	° ' " +32 3
Jan. 0.5	44.799	15.06	53.299	49.78	40.202	66.19	25.148	64.78
10.5	44.932 ¹³³	13.94 ¹¹²	53.458 ¹⁵⁰	50.12 ³⁴	40.298 ⁹⁶	66.72 ³⁵³	25.313 ¹⁶⁵	65.10 ³²
20.5	45.016 ⁸⁴	12.97 ⁹⁷	53.560 ¹⁰²	50.62 ⁵⁰	40.331 ³³	73.16 ³⁴⁴	25.420 ¹⁰⁷	65.59 ⁴⁹
30.5	45.049 ³³	12.16 ⁸¹	53.601 ⁴¹	51.23 ⁶¹	40.300 ³¹	76.40 ³²⁴	25.467 ⁴⁷	66.20 ⁶¹
Feb. 9.4	45.032 ¹⁷	11.53 ⁶³	53.586 ¹⁵	51.93 ⁷⁰	40.208 ⁹²	79.34 ²⁹⁴	25.457 ¹⁰	66.90 ⁷⁰
19.4	44.969 ⁶³	11.05 ⁴⁸	53.517 ⁶⁹	52.65 ⁷²	40.064 ¹⁴⁴	81.95 ²⁶¹	25.392 ⁶⁵	67.63 ⁷⁸
Mar. 1.4	44.866 ¹⁰³	10.73 ³²	53.400 ¹¹⁷	53.33 ⁶⁸	39.874 ¹⁹⁰	84.16 ²²¹	25.279 ¹¹³	68.34 ⁷¹
11.3	44.732 ¹³⁴	10.55 ¹⁸	53.245 ¹⁵⁵	53.96 ⁶³	39.646 ¹⁷⁶	85.92 ¹⁷⁶	25.127 ¹⁵²	68.99 ⁶⁵
21.3	44.576 ¹⁵⁶	10.47 ⁸	53.065 ¹⁸⁰	54.48 ⁵²	39.391 ²⁵⁵	87.23 ¹³¹	24.949 ¹⁷⁸	69.54 ³⁵
31.3	44.407 ¹⁶⁹	10.49 ²	52.870 ¹⁹⁵	54.87 ³⁹	39.121 ²⁷⁰	88.07 ⁸⁴	24.755 ¹⁹⁴	69.95 ⁴¹
Apr. 10.3	44.238 ¹⁶⁹	10.60 ¹¹	52.672 ¹⁹⁶	55.09 ²²	38.847 ²⁷⁴	88.42 ³⁵	24.556 ¹⁹⁹	70.20 ²⁵
20.2	44.077 ¹⁶¹	10.79 ¹⁹	52.482 ¹⁹⁰	55.15 ⁶	38.580 ²⁶⁷	88.28 ¹⁴	24.365 ¹⁹¹	70.30 ¹⁰
30.2	43.931 ¹⁴⁶	11.07 ²⁸	52.312 ¹⁷⁰	55.06 ⁹	38.329 ²⁵¹	87.68 ⁶⁰	24.191 ¹⁷⁴	70.23 ⁷
May 10.2	43.810 ¹²¹	11.40 ³³	52.169 ¹⁴³	54.80 ²⁶	38.102 ²²⁷	86.63 ¹⁰⁵	24.044 ¹⁴⁷	69.99 ²⁴
20.2	43.717 ⁹³	11.79 ³⁹	52.060 ¹⁰⁹	54.41 ³⁹	37.907 ¹⁹⁵	85.16 ¹⁴⁷	23.931 ¹¹³	69.62 ³⁷
30.1	43.658 ⁵⁹	12.25 ⁴⁶	51.989 ⁷¹	53.91 ⁵⁰	37.750 ¹⁵⁷	83.31 ¹⁸⁵	23.855 ⁷⁶	69.12 ⁵⁰
June 9.1	43.634 ²⁴	12.77 ⁵²	51.960 ²⁹	53.31 ⁶⁰	37.634 ¹¹⁶	81.12 ²¹⁹	23.820 ³⁵	68.52 ⁶⁰
19.1	43.646 ¹²	13.32 ⁵⁵	51.974 ¹⁴	52.64 ⁶⁷	37.563 ⁷¹	78.65 ²⁴⁷	23.828 ⁸	67.83 ⁶⁹
29.0	43.693 ⁴⁷	13.91 ⁵⁰	52.030 ⁵⁶	51.90 ⁷⁴	37.538 ²⁵	75.97 ²⁶⁸	23.876 ⁴⁸	67.09 ⁷⁴
July 9.0	43.776 ⁸³	14.51 ⁵⁹	52.126 ⁹⁶	51.14 ⁷⁶	37.560 ²²	73.15 ²⁸²	23.968 ⁹⁰	66.30 ⁷⁹
19.0	43.891 ¹¹⁵	15.09 ⁵⁸	52.261 ¹³⁵	50.35 ⁷⁹	37.629 ⁶⁹	70.28 ²⁸⁷	24.095 ¹²⁹	65.48 ⁸²
29.0	44.036 ¹⁴⁵	15.64 ⁵⁵	52.433 ¹⁷²	49.54 ⁸¹	37.743 ¹¹⁴	67.45 ²⁸³	24.260 ¹⁶⁵	64.63 ⁸⁵
Aug. 7.9	44.210 ¹⁷⁴	16.11 ⁴⁷	52.637 ²⁰⁴	48.71 ⁸³	37.901 ¹⁵⁸	64.73 ²⁷²	24.458 ¹⁹⁶	63.76 ⁸⁷
17.9	44.408 ¹⁹⁸	16.47 ³⁶	52.870 ²³³	47.87 ⁸⁴	38.102 ²⁰¹	62.25 ²⁴⁸	24.685 ²²⁷	62.87 ⁸⁹
27.9	44.631 ²²³	16.69 ²²	53.131 ²⁶¹	47.03 ⁸⁴	38.340 ²³⁸	60.09 ²¹⁶	24.941 ²⁵⁶	61.98 ⁸⁹
Sept. 6.9	44.873 ²⁴²	16.74 ⁵	53.414 ²⁸³	46.17 ⁸⁶	38.614 ²⁷⁴	58.32 ¹⁷⁷	25.219 ²⁷⁸	61.07 ⁹¹
16.8	45.134 ²⁶¹	16.58 ¹⁶	53.719 ³⁰⁵	45.31 ⁸⁶	38.918 ³⁰⁴	57.02 ¹³⁰	25.521 ³⁰²	60.15 ⁹²
26.8	45.410 ²⁷⁶	16.22 ³⁶	54.041 ³²²	44.45 ⁸⁶	39.246 ³²⁸	56.27 ⁷⁵	25.839 ³¹⁸	59.23 ⁹²
Oct. 6.8	45.699 ²⁸⁹	15.65 ⁵⁷	54.377 ³³⁶	43.60 ⁸⁵	39.595 ³⁴⁹	56.10 ¹⁷	26.173 ³³⁴	58.32 ⁹¹
16.7	45.997 ²⁹⁸	14.85 ⁸⁰	54.724 ³⁴⁷	42.77 ⁸³	39.955 ³⁶⁰	56.55 ⁴⁵	26.519 ³⁴⁶	57.43 ⁸⁹
26.7	46.302 ³⁰⁵	13.86 ⁹⁹	55.078 ³⁵⁴	41.99 ⁷⁸	40.319 ³⁶⁴	57.61 ¹⁰⁶	26.873 ³⁵⁴	56.60 ⁸³
Nov. 5.7	46.605 ³⁰³	12.69 ¹¹⁷	55.432 ³⁵⁴	41.30 ⁶⁹	40.678 ³⁵⁹	59.25 ¹⁶⁴	27.227 ³⁵⁴	55.84 ⁷⁶
15.7	46.903 ²⁹⁸	11.40 ¹²⁹	55.778 ³⁴⁶	40.70 ⁶⁰	41.021 ³⁴³	61.43 ²¹⁸	27.576 ³⁴⁹	55.20 ⁶⁴
25.6	47.189 ²⁸⁶	10.03 ¹³⁷	56.112 ³³⁴	40.24 ⁴⁶	41.340 ³¹⁹	64.09 ²⁶⁶	27.912 ³³⁶	54.69 ⁵¹
Dec. 5.6	47.453 ²⁶⁴	8.62 ¹⁴¹	56.421 ³⁰⁹	39.95 ²⁹	41.626 ²⁸⁶	67.13 ³⁰⁴	28.225 ³¹³	54.34 ³⁵
15.6	47.691 ²³⁸	7.24 ¹³⁸	56.699 ²⁷⁸	39.82 ¹³	41.868 ²⁴²	70.44 ³³¹	28.508 ²⁸³	54.19 ¹⁵
25.6	47.892 ²⁰¹	5.92 ¹³²	56.936 ²³⁷	39.88 ⁶	42.057 ¹⁸⁹	73.94 ³⁵⁰	28.750 ²⁴²	54.21 ²
35.5	48.051 ¹⁵⁹	4.73 ¹¹⁹	57.125 ¹⁸⁹	40.14 ²⁶	42.190 ¹³³	77.49 ³⁵⁵	28.943 ¹⁹³	54.43 ²²
Mean Place	42.305	19.80	50.378	55.95	37.702	65.30	22.235	71.37
Sec δ , Tan δ	1.011	+0.149	1.178	+0.624	1.370	-0.937	1.180	+0.626
$D\alpha$, $D\alpha$	+0.07	0.00	+0.08	+0.01	+0.05	-0.02	+0.06	+0.02
$D\delta$, $D\delta$	-0.1	+0.9	-0.1	+0.9	-0.1	+0.9	-0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	25 Monocerotis. Mag. 5.2		α Canis Minoris. (Procyon.) Mag. 0.5		24 Lyncis. Mag. 5.0		κ Geminorum. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 33	° ' " - 3 55	h m 7 35	° ' " + 5 25	h m 7 36	° ' " +58 53	h m 7 39	° ' " +24 35
	s 7 33	" - 3 55	s 7 35	" + 5 25	s 7 36	" +58 53	s 7 39	" +24 35
Jan. 0.5	14.421 133	40.97 189	3.006 138	64.36 137	8.999 239	64.95 184	32.716 166	37.42 17
10.5	14.554 85	42.86 174	3.144 88	62.99 119	9.238 149	66.79 200	32.882 113	37.25 1
20.5	14.639 34	44.60 154	3.232 38	61.80 103	9.387 56	68.79 208	32.995 57	37.24 15
30.5	14.673 14	46.14 134	3.270 11	60.77 83	9.443 36	70.87 207	33.052 0	37.39 28
Feb. 9.4	14.659 61	47.48 110	3.259 58	59.94 64	9.407 123	72.94 196	33.052 50	37.67 37
19.4	14.598 99	48.58 88	3.201 98	59.30 48	9.284 201	74.90 178	33.002 95	38.04 42
Mar. 1.4	14.499 132	49.46 64	3.103 131	58.82 31	9.083 263	76.68 150	32.907 133	38.46 43
11.4	14.367 154	50.10 42	2.972 152	58.51 15	8.820 311	78.18 116	32.774 161	38.89 41
21.3	14.213 168	50.52 19	2.820 167	58.36 3	8.509 339	79.34 78	32.613 177	39.30 35
31.3	14.045 171	50.71 0	2.653 170	58.33 9	8.170 351	80.12 37	32.436 181	39.65 26
Apr. 10.3	13.874 164	50.71 21	2.483 162	58.42 20	7.819 344	80.49 5	32.255 176	39.91 19
20.2	13.710 151	50.50 39	2.321 148	58.62 30	7.475 319	80.44 45	32.079 161	40.10 9
30.2	13.559 128	50.11 57	2.173 125	58.92 38	7.156 283	79.14 85	31.918 139	40.19 0
May 10.2	13.431 103	49.54 75	2.048 98	59.30 46	6.873 231	79.94 120	31.779 108	40.19 9
20.2	13.328 72	48.79 89	1.950 66	59.76 55	6.642 175	77.94 152	31.671 75	40.10 16
30.1	13.256 38	47.90 102	1.884 33	60.31 61	6.467 110	76.42 177	31.596 38	39.94 24
June 9.1	13.218 5	46.88 114	1.851 2	60.92 66	6.357 41	74.65 197	31.558 0	39.70 28
19.1	13.213 30	45.74 121	1.853 38	61.58 71	6.316 242	72.68 214	31.558 76	39.42 33
29.1	13.243 64	44.53 125	1.891 72	62.29 70	6.342 95	70.54 224	31.596 38	39.09 37
July 9.0	13.307 96	43.28 125	1.963 105	62.99 89	6.437 161	68.30 227	31.672 112	38.72 41
19.0	13.403 127	42.03 119	2.068 133	63.68 64	6.598 223	66.03 229	31.784 144	38.31 45
29.0	13.530 156	40.84 111	2.201 163	64.32 56	6.821 282	63.74 224	31.928 176	37.86 50
Aug. 7.9	13.686 182	39.73 96	2.364 188	64.88 44	7.103 335	61.50 215	32.104 204	37.36 55
17.9	13.868 207	38.77 75	2.552 212	65.32 28	7.438 383	59.35 204	32.308 230	36.81 61
27.9	14.075 228	38.02 52	2.764 233	65.60 9	7.821 425	57.31 188	32.538 254	36.20 70
Sept. 6.9	14.303 247	37.50 23	2.997 253	65.69 13	8.246 463	55.43 169	32.792 275	35.50 75
16.8	14.550 267	37.27 8	3.250 269	65.56 36	8.709 496	53.74 147	33.067 293	34.75 83
26.8	14.817 280	37.35 40	3.519 283	65.20 61	9.205 520	52.27 122	33.360 311	33.92 89
Oct. 6.8	15.097 290	37.75 75	3.802 293	64.59 85	9.725 540	51.05 94	33.671 322	33.03 95
16.8	15.387 298	38.50 108	4.095 300	63.74 110	10.265 549	50.11 63	33.993 331	32.08 97
26.7	15.685 299	39.58 137	4.395 302	62.64 128	10.814 550	49.48 30	34.324 335	31.11 99
Nov. 5.7	15.984 294	40.95 163	4.697 298	61.36 145	11.364 538	49.18 5	34.659 331	30.12 95
15.7	16.278 283	42.58 181	4.995 286	59.91 155	11.902 516	49.23 42	34.990 321	29.17 88
25.6	16.561 263	44.39 195	5.281 266	58.36 161	12.418 479	49.65 78	35.311 302	28.29 75
Dec. 5.6	16.824 236	46.34 201	5.547 240	56.75 160	12.897 427	50.43 113	35.613 273	27.54 63
15.6	17.060 200	48.35 202	5.787 204	55.15 155	13.324 364	51.56 144	35.886 238	26.91 46
25.6	17.260 159	50.37 194	5.991 163	53.60 145	13.688 287	53.00 172	36.124 193	26.45 28
35.5	17.419	52.31	6.154	52.15	13.975	54.72	36.317	26.17
Mean Place	12.045	36.86	0.618	69.26	4.671	73.27	30.002	44.21
Sec δ , Tan δ	1.002	-0.069	1.004	+0.095	1.936	+1.658	1.100	+0.458
$D\phi a$, $D_m a$	+0.06	0.00	+0.06	0.00	+0.10	+0.04	+0.07	+0.03
$D\phi \delta$, $D_m \delta$	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Geminorum. (Pollux.) Mag. 1.2		γ Puppis. Mag. 5.1		ξ Argus. Mag. 3.5		ϕ Geminorum. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 40	° ' " +28 13	h m 7 42	° ' " -14 21	h m 7 45	° ' " -24 39	h m 7 48	° ' " +26 58
Jan. 0.5	20.836	23.96	12.647	52.47	53.057	13.65	31.653	37.43
10.5	21.006	24.01	12.784	54.94	53.189	16.60	31.831	37.35
20.5	21.121	24.24	12.870	57.28	53.270	19.44	31.955	37.47
30.5	21.179	24.61	12.904	59.41	53.298	22.08	32.023	37.76
Feb. 9.4	21.179	25.09	12.888	61.32	53.273	24.49	32.034	38.18
19.4	21.127	25.65	12.826	62.96	53.199	26.60	31.991	38.68
Mar. 1.4	21.027	26.24	12.723	64.32	53.083	28.38	31.901	39.23
11.4	20.889	26.80	12.588	65.36	52.933	29.81	31.772	39.79
21.3	20.722	27.31	12.428	66.10	52.757	30.87	31.613	40.31
31.3	20.538	27.74	12.254	66.55	52.566	31.56	31.436	40.75
Apr. 10.3	20.349	28.04	12.075	66.69	52.369	31.86	31.252	41.09
20.2	20.165	28.21	11.900	66.54	52.175	31.80	31.071	41.32
30.2	19.997	28.26	11.738	66.12	51.992	31.39	30.905	41.43
May 10.2	19.851	28.18	11.595	65.43	51.830	30.62	30.759	41.41
20.2	19.736	27.97	11.478	64.49	51.692	29.52	30.643	41.29
30.1	19.657	27.67	11.390	63.31	51.585	28.13	30.560	41.05
June 9.1	19.614	27.28	11.335	61.95	51.510	26.48	30.512	40.73
19.1	19.611	26.81	11.313	60.42	51.470	24.61	30.504	40.33
29.1	19.648	26.28	11.326	58.76	51.466	22.57	30.534	39.87
July 9.0	19.723	25.70	11.373	57.03	51.498	20.41	30.601	39.36
19.0	19.836	25.07	11.454	55.27	51.566	18.21	30.705	38.79
29.0	19.982	24.41	11.568	53.56	51.670	16.04	30.842	38.17
Aug. 7.9	20.161	23.69	11.710	51.96	51.806	13.97	31.013	37.50
17.9	20.370	22.95	11.882	50.51	51.975	12.07	31.213	36.77
27.9	20.604	22.16	12.079	49.30	52.173	10.44	31.439	35.99
Sept. 6.9	20.865	21.32	12.302	48.36	52.398	9.13	31.691	35.16
16.8	21.146	20.44	12.547	47.78	52.649	8.20	31.965	34.26
26.8	21.447	19.52	12.812	47.59	52.921	7.72	32.259	33.31
Oct. 6.8	21.765	18.56	13.092	47.81	53.212	7.74	32.572	32.32
16.8	22.095	17.59	13.385	48.45	53.517	8.25	32.898	31.29
26.7	22.435	16.63	13.687	49.51	53.830	9.26	33.234	30.25
Nov. 5.7	22.778	15.70	13.991	50.97	54.146	10.75	33.576	29.24
15.7	23.118	14.85	14.290	52.78	54.457	12.68	33.916	28.29
25.6	23.447	14.11	14.578	54.88	54.753	14.98	34.246	27.43
Dec. 5.6	23.756	13.50	14.845	57.20	55.029	17.59	34.558	26.72
15.6	24.038	13.06	15.085	59.67	55.273	20.40	34.845	26.15
25.6	24.281	12.81	15.288	62.19	55.479	23.35	35.094	25.77
35.5	24.479	12.75	15.450	64.69	55.640	26.32	35.299	25.61
Mean Place	18.044	31.08	10.326	49.24	50.735	11.50	28.911	44.98
Sec δ , Tan δ	1.135	+0.537	1.032	-0.256	1.100	-0.459	1.122	+0.509
$D\psi\alpha$, $D\omega\alpha$	+0.07	+0.02	+0.05	-0.01	+0.05	-0.01	+0.07	+0.02
$D\psi\delta$, $D\omega\delta$	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington on Time.	26 Lyncis. Mag. 5.7		Groombridge 1874. Mag. 5.6		χ Argus. Mag. 3.6		ω Cancri. Mag. 5.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 48	° ' " +47 46	h m 7 50	° ' " +74 7	h m 7 54	° ' " -52 45	h m 7 55	° ' " +25 36
n. 0.6	48.370	33.15	31.77	70.09	44.342	42.61	61.001	57.81
10.5	48.589	34.33	32.19	72.54	44.474	46.38	61.185	57.63
20.5	48.738	35.71	32.45	75.19	44.531	50.13	61.316	57.65
30.5	48.815	37.21	32.53	77.92	44.515	53.73	61.391	57.85
b. 9.4	48.817	38.78	32.45	80.61	44.425	57.11	61.410	58.18
19.4	48.750	40.33	32.20	83.15	44.270	60.17	61.376	58.62
r. 1.4	48.622	41.78	31.80	85.45	44.057	62.87	61.293	59.13
11.4	48.441	43.08	31.30	87.40	43.796	65.15	61.171	59.66
21.3	48.220	44.14	30.70	88.93	43.498	66.96	61.018	60.17
31.3	47.975	44.93	30.03	89.98	43.177	68.30	60.847	60.62
x. 10.3	47.719	45.43	29.33	90.52	42.844	69.12	60.667	61.00
20.3	47.466	45.59	28.62	90.51	42.510	69.42	60.489	61.26
30.2	47.229	45.44	27.95	89.99	42.186	69.22	60.324	61.42
ay 10.2	47.019	44.99	27.33	88.97	41.884	68.52	60.178	61.47
20.2	46.846	44.22	26.79	87.49	41.612	67.34	60.060	61.42
30.1	46.717	43.20	26.35	85.61	41.375	65.71	59.974	61.27
me 9.1	46.636	41.96	26.03	83.37	41.180	63.69	59.921	61.01
19.1	46.605	40.53	25.82	80.85	41.034	61.33	59.906	60.69
29.1	46.626	38.96	25.74	78.12	40.940	58.67	59.929	60.31
ly 9.0	46.699	37.28	25.79	75.25	40.899	55.82	59.989	59.86
19.0	46.821	35.53	25.98	72.30	40.914	52.84	60.083	59.35
29.0	46.990	33.74	26.28	69.34	40.984	49.83	60.212	58.79
ig. 8.0	47.203	31.96	26.70	66.43	41.111	46.88	60.373	58.17
17.9	47.456	30.19	27.22	63.63	41.292	44.10	60.563	57.48
27.9	47.746	28.46	27.86	61.01	41.525	41.59	60.780	56.73
pt. 6.9	48.069	26.81	28.58	58.59	41.806	39.44	61.022	55.91
16.8	48.423	25.26	29.38	56.44	42.132	37.76	61.288	55.01
26.8	48.803	23.82	30.25	54.60	42.496	36.60	61.575	54.05
t. 6.8	49.206	22.53	31.17	53.11	42.890	36.03	61.881	53.02
16.8	49.627	21.43	32.13	52.01	43.305	36.10	62.201	51.94
26.7	50.059	20.52	33.11	51.33	43.732	36.80	62.533	50.85
rv. 5.7	50.496	19.85	34.09	51.09	44.158	38.15	62.872	49.76
15.7	50.929	19.44	35.05	51.32	44.574	40.10	63.211	48.71
25.7	51.350	19.32	35.97	52.02	44.961	42.58	63.541	47.75
xc. 5.6	51.744	19.50	36.83	53.18	45.312	45.55	63.855	46.92
15.6	52.104	19.98	37.59	54.78	45.615	48.87	64.144	46.24
25.6	52.416	20.76	38.23	56.77	45.858	52.46	64.397	45.75
35.5	52.672	21.82	38.74	59.08	46.033	56.19	64.608	45.47
1 Place	44.914	42.22	24.529	80.17	41.669	43.54	58.308	65.73
2, Tan δ	1.488	+1.102	3.658	+3.518	1.653	-1.316	1.109	+0.479
, D α	+0.09	+0.03	+0.14	+0.11	+0.03	-0.04	+0.07	+0.02
, D δ	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Geminorum. Mag. 5.0		γ Lynceis. Mag. 4.9		ρ Argus. Mag. 2.9		δ H. Ursae M. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	De t
	h m 7 58	° ' " +28 1	h m 8 2	° ' " +51 44	h m 8 4	° ' " -24 3	h m 8 4	+
Jan. 0.6	31.868 ¹⁹¹	22.35 ⁴	21.556 ²⁵¹	29.09 ¹³³	5.382 ¹⁵²	63.52 ²⁹⁵	45.81 ³⁸	50
10.5	32.059 ¹³⁵	22.31 ¹⁶	21.807 ¹⁷⁶	30.42 ¹⁵⁵	5.534 ¹⁰¹	66.47 ²⁸⁶	46.19 ²⁴	52
20.5	32.194 ⁷⁸	22.47 ³⁴	21.983 ⁹⁷	31.97 ¹⁷²	5.635 ⁴⁷	69.33 ²⁸⁶	46.43 ¹³	54
30.5	32.272 ²¹	22.81 ⁴⁸	22.080 ¹⁸	33.69 ¹⁷⁹	5.682 ⁵	72.02 ²⁶⁵	46.56 ¹	57
Feb. 9.5	32.293 ²³	23.29 ⁵⁷	22.098 ⁵⁹	35.48 ¹⁷⁸	5.677 ⁵⁵	74.47 ²¹⁷	46.55 ¹³	59
19.4	32.260 ⁸³	23.86 ⁶³	22.039 ¹²⁸	37.26 ¹⁶⁷	5.622 ⁹⁹	76.64 ¹⁸⁷	46.42 ²⁶	62
Mar. 1.4	32.177 ¹²⁴	24.49 ⁶³	21.911 ¹⁸⁵	38.93 ¹⁵³	5.523 ¹³⁵	78.51 ¹⁵³	46.16 ³⁴	64
11.4	32.053 ¹⁵⁵	25.12 ⁶⁰	21.726 ²⁸²	40.45 ¹²⁷	5.388 ¹⁶³	80.03 ¹¹⁶	45.82 ⁴²	66
21.3	31.898 ¹⁷⁴	25.72 ⁵¹	21.494 ²⁶³	41.72 ⁹⁹	5.225 ¹⁸¹	81.19 ⁸⁰	45.40 ⁴⁸	67
31.3	31.724 ¹⁸⁴	26.23 ⁴¹	21.231 ²⁷⁸	42.71 ⁶⁴	5.044 ¹⁹¹	81.99 ⁴⁴	44.92 ⁵¹	69
Apr. 10.3	31.540 ¹⁸²	26.64 ²⁸	20.953 ²⁷⁹	43.35 ²⁸	4.853 ¹⁹⁰	82.43 ⁶	44.41 ⁵¹	69
20.3	31.358 ¹⁷⁰	26.92 ¹⁵	20.674 ²⁶⁴	43.63 ⁷	4.663 ¹⁸¹	82.49 ²⁹	43.90 ⁵⁰	70
30.2	31.188 ¹⁵⁰	27.07 ²	20.410 ²⁴⁰	43.56 ⁴³	4.482 ¹⁶⁴	82.20 ⁶³	43.40 ⁴⁶	69
May 10.2	31.038 ¹²²	27.09 ¹¹	20.170 ²⁰⁴	43.13 ⁷⁶	4.318 ¹⁴³	81.57 ⁹⁶	42.94 ⁴¹	67
20.2	30.916 ⁹²	26.98 ²⁵	19.966 ¹⁶⁰	42.37 ¹⁰⁷	4.175 ¹¹⁵	80.61 ¹²⁶	42.53 ³³	67
30.2	30.824 ⁵⁵	26.73 ³⁴	19.806 ¹¹⁰	41.30 ¹³³	4.060 ⁸⁴	79.35 ¹⁵³	42.20 ²⁶	66
June 9.1	30.769 ¹⁸	26.39 ⁴³	19.696 ⁵⁸	39.97 ¹⁸⁶	3.976 ⁵⁴	77.82 ¹⁷³	41.95 ¹⁶	64
19.1	30.751 ²⁰	25.96 ⁵²	19.638 ³	38.41 ¹⁷³	3.922 ¹⁸	76.07 ¹⁹⁵	41.79 ⁸	62
29.1	30.771 ⁵⁸	25.44 ⁵⁹	19.635 ⁵²	36.68 ¹⁸⁸	3.904 ¹⁷	74.14 ²⁰⁶	41.71 ³	59
July 9.0	30.829 ⁹³	24.85 ⁶⁵	19.687 ¹⁰⁶	34.80 ¹⁹⁷	3.921 ⁵⁰	72.09 ²¹³	41.74 ¹¹	56
19.0	30.922 ¹²⁸	24.20 ⁷²	19.793 ¹⁵⁶	32.83 ²⁰³	3.971 ⁸⁶	69.96 ²¹¹	41.85 ²²	54
29.0	31.050 ¹⁶¹	23.48 ⁷⁷	19.949 ²⁰⁵	30.80 ²⁰⁶	4.057 ¹¹⁹	67.85 ²⁰³	42.07 ³⁰	51
Aug. 8.0	31.211 ¹⁹⁰	22.71 ⁸³	20.154 ²⁵⁰	28.74 ²⁰⁴	4.176 ¹⁵¹	65.82 ¹⁸⁸	42.37 ³⁷	48
17.9	31.401 ²²⁰	21.88 ⁸⁸	20.404 ²⁹²	26.70 ²⁰⁰	4.327 ¹⁸⁰	63.94 ¹⁶⁴	42.74 ⁴⁶	45
27.9	31.621 ²⁴⁴	21.00 ⁹⁴	20.696 ³³⁰	24.70 ¹⁹²	4.507 ²¹¹	62.30 ¹³³	43.20 ⁵²	43
Sept. 6.9	31.865 ²⁷⁰	20.06 ¹⁰²	21.026 ³⁶⁶	22.78 ¹⁸¹	4.718 ²³⁸	60.97 ⁹⁷	43.72 ⁵⁹	40
16.8	32.135 ²⁹¹	19.04 ¹⁰⁵	21.392 ³⁹⁷	20.97 ¹⁶⁶	4.956 ²⁶³	60.00 ⁵⁴	44.31 ⁶⁴	38
26.8	32.426 ³¹¹	17.99 ¹¹⁰	21.789 ⁴²⁴	19.31 ¹⁵⁰	5.219 ²⁸³	59.46 ⁷	44.95 ⁶⁹	36
Oct. 6.8	32.737 ³²⁶	16.89 ¹¹²	22.213 ⁴⁴⁷	17.81 ¹²⁹	5.502 ³⁰¹	59.39 ⁴³	45.64 ⁷³	34
16.8	33.063 ³³⁹	15.77 ¹¹¹	22.660 ⁴⁶²	16.52 ¹⁰⁵	5.803 ³¹³	59.82 ⁹²	46.37 ⁷⁴	33
26.7	33.402 ³⁴⁵	14.66 ¹⁰⁸	23.122 ⁴⁷⁰	15.47 ⁷⁸	6.116 ³¹⁷	60.74 ¹⁴¹	47.11 ⁷⁶	32
Nov. 5.7	33.747 ³⁴⁶	13.58 ¹⁰¹	23.592 ⁴⁶⁹	14.69 ⁴⁸	6.434 ³¹⁸	62.15 ¹⁸⁵	47.87 ⁷⁵	32
15.7	34.093 ³³⁹	12.57 ⁹⁰	24.081 ⁴⁵⁹	14.21 ¹⁴	6.751 ³⁰⁶	64.00 ²²³	48.62 ⁷³	31
25.7	34.432 ³²²	11.67 ⁷⁴	24.520 ⁴³³	14.07 ²⁰	7.057 ²⁸⁸	66.23 ²⁶⁴	49.35 ⁶⁷	32
Dec. 5.6	34.754 ²⁹⁵	10.93 ⁵⁸	24.953 ³⁹⁷	14.27 ⁵³	7.345 ²⁵⁹	68.77 ²⁷⁷	50.02 ⁶²	33
15.6	35.049 ²⁶⁰	10.35 ³⁸	25.350 ³⁴⁹	14.80 ⁸⁸	7.604 ²²⁴	71.54 ²⁹¹	50.64 ⁵⁴	34
25.6	35.309 ²¹⁷	9.97 ¹⁵	25.699 ²⁸⁹	15.68 ¹¹⁸	7.828 ¹⁸⁰	74.45 ²⁹⁵	51.18 ⁴⁴	35
35.5	35.526	9.82	25.988	16.86	8.008	77.40	51.62	37
Mean Place	29.129	30.66	17.926	39.61	3.091	61.46	40.251	61
Sec δ , Tan δ	1.133	+0.532	1.614	+1.268	1.095	-0.447	2.755	+2
$D\psi\alpha$, $D_\omega\alpha$	+0.07	+0.02	+0.09	+0.04	+0.05	-0.02	+0.12	+0
$D\psi\delta$, $D_\omega\delta$	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9	-0.2	+0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Argus. Mag. 2.2		ζ Cancri (<i>mean</i>). Mag. 4.7		Bradley 1147. Mag. 5.7		80 Puppis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 7	° ' -47 5	h m 8 7	° ' +17 53	h m 8 9	° ' +76 0	h m 8 9	° ' -15 32
	s 8 7	" "	s 8 7	" "	s 8 9	" "	s 8 9	" "
Jan. 0.6	2.906 152	39.51 367	33.213 185	38.31 70	24.51 53	20.33 242	36.103 162	28.55 256
10.5	3.058 85	43.18 367	33.398 135	37.61 51	25.04 34	22.75 266	36.265 113	31.11 247
20.5	3.143 18	46.84 352	33.533 82	37.10 31	25.38 16	25.41 277	36.378 61	33.58 228
30.5	3.161 49	50.36 332	33.615 29	36.79 14	25.54 3	28.18 279	36.439 11	35.86 207
Feb. 9.5	3.112 109	53.68 303	33.644 22	36.65 2	25.51 23	30.97 270	36.450 38	37.93 181
19.4	3.003	56.71	33.622	36.67	25.28	33.67	36.412	39.74
Mar. 1.4	2.839 164	59.38 267	33.554 68	36.81 14	24.90 38	36.14 247	36.330 82	41.25 151
11.4	2.629 210	61.65 227	33.447 107	37.05 24	24.37 53	38.30 216	36.212 118	42.47 122
21.3	2.385 244	63.48 183	33.310 137	37.33 28	23.71 66	40.05 175	36.067 175	43.39 92
31.3	2.115 270	64.84 136	33.154 156	37.65 32	22.98 73	41.34 129	35.903 164	43.99 60
	281	89	168	31	79	78	172	30
Apr. 10.3	1.834	65.73	32.986	37.96	22.19	42.12	35.731	44.29
20.3	1.550 284	66.12 39	32.821 165	38.25 29	21.39 80	42.36 24	35.558 173	44.30 1
30.2	1.274 276	66.02 10	32.664 157	38.51 26	20.61 78	42.06 30	35.394 164	44.01 29
May 10.2	1.016 258	65.44 58	32.524 140	38.73 22	19.87 74	41.23 83	35.245 149	43.45 56
20.2	0.780 236	64.39 106	32.409 115	38.91 18	19.22 65	39.91 132	35.117 128	42.62 83
	203	147	87	14	56	176	103	106
30.2	0.577 166	62.92	32.322	39.05	18.66	38.15	35.014	41.56
June 9.1	0.411 126	61.06 186	32.266 56	39.14 9	18.21 45	36.00 215	34.940 74	40.28 128
19.1	0.285 83	58.85 221	32.244 22	39.20 6	17.90 31	33.52 248	34.897 43	38.83 145
29.1	0.202 32	56.36 249	32.257 13	39.22 2	17.74 16	30.80 272	34.887 10	37.23 160
July 9.0	0.170 12	53.67 283	32.302 79	39.20 8	17.71 11	27.89 304	34.910 53	35.55 173
19.0	0.182	50.84	32.381	39.12	17.82	24.85	34.963	33.82
29.0	0.243 61	47.97 287	32.492 111	38.98 14	18.06 26	21.76 309	35.049 86	32.11 171
Aug. 8.0	0.353 110	45.14 283	32.632 140	38.77 21	18.46 38	18.70 306	35.167 118	30.49 162
17.9	0.510 157	42.48 266	32.801 169	38.46 31	18.98 52	15.71 299	35.313 146	29.00 149
27.9	0.714 204	40.04 244	32.996 195	38.04 42	19.62 64	12.85 286	35.488 175	27.73 127
	247	209	221	53	75	265	203	100
Sept. 6.9	0.961	37.95	33.217	37.51	20.37	10.20	35.691	26.73
16.9	1.247 286	36.29 166	33.461 244	36.83 68	21.21 84	7.79 241	35.918 227	26.05 68
26.8	1.569 322	35.14 115	33.727 266	36.02 81	22.13 92	5.68 211	36.170 252	25.77 28
Oct. 6.8	1.922 353	34.56 58	34.012 285	35.07 95	23.13 100	3.91 177	36.442 272	25.89 12
16.8	2.296 374	34.59 3	34.315 303	34.01 106	24.18 105	2.52 139	36.731 289	26.44 55
	388	64	315	119	109	96	302	99
26.7	2.684	35.23	34.630	32.82	25.27	1.56	37.033	27.43
Nov. 5.7	3.078 394	36.49 126	34.953 323	31.56 126	26.37 110	1.06 50	37.342 309	28.81 138
15.7	3.465 387	38.36 187	35.278 325	30.27 129	27.46 109	1.04 49	37.652 310	30.58 177
25.7	3.834 369	40.75 269	35.597 319	28.99 128	28.51 105	1.53 49	37.953 301	32.67 209
Dec. 5.6	4.173 339	43.59 284	35.901 304	27.76 123	29.49 98	2.50 97	38.240 287	35.00 233
	298	321	283	111	90	144	261	250
15.6	4.471	46.80	36.184	26.65	30.39	3.94	38.501	37.50
25.6	4.720 249	50.28 348	36.434 260	25.66 99	31.17 78	5.81 187	38.729 228	40.10 260
35.6	4.909 189	53.90 362	36.646 212	24.85 81	31.78 61	8.05 224	38.916 187	42.69 259
Mean Place	0.396	40.33	30.686	46.03	16.694	32.44	33.830	25.32
Sec δ , Tan δ	1.469	-1.076	1.050	+0.323	4.136	+4.013	1.038	-0.278
$D\alpha$, $D\alpha$	+0.04	-0.04	+0.07	+0.01	+0.15	+0.14	+0.05	-0.01
$D\delta$, $D\delta$	-0.2	+0.9	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Cancri. Mag. 3.8		δ Lynxis. Mag. 4.4		δ^1 Cancri. Mag. 5.9		ϵ Argus. Mag. 1.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 12	° ' " + 9 26	h m 8 17	° ' " +43 26	h m 8 18	° ' " +18 35	h m 8 20	° ' " -59 14
Jan. 0.6	6.578 ¹⁸¹	14.13 ¹²²	16.913 ²⁴³	57.11 ⁸⁰	42.759 ¹⁹⁷	38.49 ⁶⁹	52.796 ¹⁸⁴	40.43 ³⁸⁴
10.5	6.759 ¹³³	12.91 ¹⁰⁵	17.156 ¹⁷⁹	57.91 ¹⁰³	42.956 ¹⁴⁸	37.80 ⁵⁰	52.990 ⁹⁸	44.27 ³⁸⁴
20.5	6.892 ⁸¹	11.86 ⁸⁵	17.335 ¹¹¹	58.94 ¹²³	43.104 ⁹³	37.30 ²⁰	53.078 ¹¹	48.14 ³⁸⁷
30.5	6.973 ³⁰	11.01 ⁶⁵	17.446 ⁴¹	60.17 ¹³⁶	43.197 ⁴⁰	37.01 ¹¹	53.069 ⁷³	51.96 ³⁸³
Feb. 9.5	7.003 ²⁰	10.36 ⁴⁶	17.487 ²⁴	61.53 ¹⁴³	43.237 ¹²	36.90 ⁶	53.016 ¹⁵³	55.61 ³⁸⁵
19.4	6.983 ⁶⁴	9.90 ²⁸	17.463 ⁸⁶	62.96 ¹⁴¹	43.225 ⁵⁹	36.96 ²⁰	52.863 ²²²	58.99 ³⁰⁶
Mar. 1.4	6.919 ¹⁰¹	9.62 ¹⁴	17.377 ¹³⁹	64.37 ¹³²	43.166 ⁹⁸	37.16 ²⁰	52.641 ²⁸⁴	62.05 ³⁸⁶
11.4	6.818 ¹³¹	9.48 ¹	17.238 ¹⁸¹	65.69 ¹¹⁷	43.068 ¹³¹	37.45 ³⁴	52.357 ³³⁰	64.73 ³⁸⁴
21.4	6.687 ¹⁵⁰	9.47 ¹⁰	17.057 ²¹⁰	66.86 ⁹⁷	42.937 ¹⁵²	37.79 ³⁷	52.027 ³⁶⁷	66.97 ¹⁷⁸
31.3	6.537 ¹⁵⁹	9.57 ¹⁷	16.847 ²²³	67.83 ⁷¹	42.785 ¹⁶⁵	38.16 ³⁷	51.660 ³⁸⁷	68.73 ¹²⁶
Apr. 10.3	6.378 ¹⁶⁰	9.74 ²⁶	16.624 ²²⁹	68.54 ⁴⁴	42.620 ¹⁶⁵	38.53 ³⁴	51.273 ³⁹⁶	69.99 ⁷⁴
20.3	6.218 ¹⁵¹	10.00 ³⁰	16.395 ²²⁰	68.98 ¹⁵	42.455 ¹⁵⁸	38.87 ³⁰	50.877 ³⁹³	70.73 ²¹
30.2	6.067 ¹³⁶	10.30 ³⁴	16.175 ²⁰⁰	69.13 ¹⁴	42.297 ¹⁴³	39.17 ²⁴	50.484 ³⁷⁸	70.94 ³⁰
May 10.2	5.931 ¹¹³	10.64 ³⁸	15.975 ¹⁷²	68.99 ⁶⁸	42.154 ⁹⁴	39.41 ¹⁴	50.106 ³¹⁸	70.64 ¹³⁰
20.2	5.818 ⁸⁸	11.02 ⁴¹	15.803 ¹³⁸	68.58 ⁹¹	42.034 ⁶³	39.61 ⁹	49.753 ²⁷⁵	69.83 ¹⁷⁵
30.2	5.730 ⁵⁷	11.43 ⁴⁴	15.665 ⁹⁸	67.90 ¹¹³	41.940 ³¹	39.75 ⁴	49.435 ²²⁷	68.53 ²¹⁵
June 9.1	5.673 ²⁵	11.87 ⁴⁵	15.567 ⁵⁴	66.99 ⁹	41.877 ¹²⁹	39.84 ²	49.160 ¹¹²	66.78 ²⁷⁵
19.1	5.648 ⁵	12.32 ⁴⁵	15.513 ⁹	65.86 ¹⁴⁴	41.846 ⁶⁹	39.88 ¹⁴	48.933 ⁴⁷	64.63 ³⁰⁶
29.1	5.653 ³⁹	12.77 ⁴¹	15.504 ⁷⁹	64.57 ¹⁶⁵	41.847 ⁹⁹	39.86 ²¹	48.761 ⁸⁶	62.13 ³⁰²
July 9.1	5.692 ⁷⁰	13.21 ³⁵	15.539 ¹²²	63.13 ¹⁷⁰	41.883 ¹³⁹	39.79 ²⁹	48.649 ¹⁵²	59.38 ²⁸⁵
19.0	5.762 ⁹⁹	13.62 ²⁶	15.618 ¹⁶²	61.58 ¹⁷²	41.952 ¹⁵⁹	39.65 ³⁸	48.602 ²¹⁸	56.43 ²⁴²
29.0	5.861 ¹²⁹	13.97 ¹⁵	15.740 ²⁰¹	59.93 ¹⁷⁴	42.051 ²¹³	39.44 ⁶²	48.620 ²⁸³	53.37 ³⁰⁶
Aug. 8.0	5.990 ¹⁵⁷	14.23 ²	15.902 ²⁷³	58.23 ¹⁷³	42.181 ²³⁶	39.15 ⁷⁶	48.706 ³⁴¹	50.35 ³⁰²
17.9	6.147 ¹⁸²	14.38 ¹⁶	16.103 ³⁰³	56.51 ¹⁶³	42.340 ²⁶⁰	38.77 ⁸⁸	48.858 ³⁹²	47.40 ¹⁵²
27.9	6.329 ²⁰⁸	14.40 ¹⁸	16.340 ³³¹	54.77 ¹⁵⁵	42.525 ²⁸⁰	38.28 ¹⁰²	49.076 ⁴³⁶	44.65 ²⁸⁵
Sept. 6.9	6.537 ²³¹	14.24 ³⁴	16.613 ³⁶⁹	53.04 ¹⁴⁸	42.738 ³¹³	37.66 ¹²⁴	49.359 ⁴⁹²	42.23 ²⁴²
16.9	6.768 ²⁵³	13.90 ⁵⁵	16.916 ³⁹⁸	51.34 ¹²⁷	42.974 ²⁶⁰	36.90 ⁸⁸	49.700 ³⁹²	40.21 ¹⁵²
26.8	7.021 ²⁷²	13.35 ⁷⁷	17.247 ³⁵⁹	49.71 ¹⁵⁵	43.234 ²⁸⁰	36.02 ¹⁰²	50.092 ⁴³⁶	38.69 ⁹⁴
Oct. 6.8	7.293 ²⁹⁰	12.58 ⁹⁷	17.606 ³⁹⁸	48.16 ¹⁴³	43.514 ³¹³	35.00 ¹¹⁵	50.528 ⁴⁹⁹	37.74 ³¹
16.8	7.583 ³⁰⁴	11.61 ¹¹⁷	17.986 ³⁶¹	46.73 ¹²⁷	43.814 ²⁹¹	33.85 ¹²⁴	50.997 ³⁷⁴	37.41 ³¹
26.8	7.887 ³¹²	10.44 ¹³³	18.384 ⁴⁰⁹	45.46 ¹⁰⁸	44.127 ³²⁴	32.61 ¹³¹	51.489 ⁴⁹⁸	37.73 ⁹⁴
Nov. 5.7	8.199 ³¹⁴	9.11 ¹⁴⁶	18.793 ⁴¹²	44.38 ⁸⁵	44.451 ³²⁸	31.30 ¹³⁴	51.987 ⁴⁸⁹	38.72 ¹⁶¹
15.7	8.513 ³⁰⁸	7.65 ¹⁵⁴	19.205 ⁴⁰⁷	43.53 ⁵⁸	44.779 ³⁴⁴	29.96 ¹³³	52.476 ⁴⁶⁸	40.35 ²²
25.7	8.821 ²⁹⁷	6.11 ¹⁵⁶	19.612 ³⁸⁹	42.95 ²⁹	45.103 ³¹¹	28.63 ¹²⁶	52.944 ⁴²⁸	42.57 ²⁷⁴
Dec. 5.6	9.118 ²⁷⁵	4.55 ¹⁵³	20.001 ³⁶¹	42.66 ⁰	45.414 ²⁹¹	27.37 ¹¹⁴	53.372 ³⁷⁴	45.31 ³¹¹
15.6	9.393 ²⁴³	3.02 ¹⁴⁴	20.362 ³²⁴	42.66 ³³	45.705 ²⁶⁰	26.23 ¹⁰⁰	53.746 ³¹⁰	48.50 ³⁵
25.6	9.636 ²⁰⁵	1.58 ¹³²	20.686 ²⁷⁴	42.99 ⁶³	45.965 ²²¹	25.23 ⁸²	54.056 ²³³	52.02 ³⁷
35.6	9.841	0.26	20.960	43.62	46.186	24.41	54.289	55.75
Mean Place	4.171	20.96	13.776	68.30	40.255	46.87	49.948	43.11
Sec δ , Tan δ	1.014	+0.166	1.378	+0.947	1.055	+0.336	1.956	-1.680
$D\phi\alpha$, $D\omega\alpha$	+0.06	+0.01	+0.08	+0.04	+0.07	+0.01	+0.02	-0.06
$D\phi\delta$, $D\omega\delta$	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 Monocerotis. Mag. 4.0		θ Chamæleontis. Mag. 4.3		σ Ursæ Majoris. Mag. 3.5		Groombridge 1450. Mag. 6.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 21	° ' " -3 38	h m 8 23	° ' " -77 13	h m 8 23	° ' " +60 59	h m 8 27	° ' " +38 17
	s 8 21	" -3 38	s 8 23	" -77 13	s 8 23	" +60 59	s 8 27	" +38 17
Jan. 0.6	36.149 180	22.20 300	12.32 28	9.67 379	32.20 33	23.88 168	38.351 238	43.55 42
10.5	36.329 133	24.20 186	12.60 8	13.46 389	32.53 24	25.56 194	38.589 182	43.97 60
20.5	36.462 82	26.05 165	12.68 12	17.35 387	32.77 15	27.50 215	38.771 119	44.66 90
30.5	36.544 31	27.70 145	12.56 28	21.22 376	32.92 5	29.65 224	38.890 55	45.56 107
Feb. 9.5	36.575 17	29.15 121	12.28 45	24.98 354	32.97 6	31.89 223	38.945 9	46.63 118
19.4	36.558 60	30.36 98	11.83 62	28.52 327	32.91 14	34.12 213	38.936 67	47.81 121
Mar. 1.4	36.498 97	31.34 74	11.21 74	31.79 291	32.77 22	36.25 195	38.869 116	49.02 117
11.4	36.401 128	32.06 53	10.47 84	34.70 249	32.55 28	38.20 166	38.753 156	50.19 108
21.4	36.273 146	32.60 29	9.63 92	37.19 204	32.27 33	39.86 182	38.597 184	51.27 98
31.3	36.127 157	32.89 9	8.71 98	39.23 154	31.94 36	41.18 98	38.413 202	52.20 73
Apr. 10.3	35.970 159	32.98 10	7.73 100	40.77 108	31.58 37	42.11 49	38.211 206	52.93 52
20.3	35.811 162	32.88 30	6.73 102	41.80 50	31.21 36	42.60 5	38.005 200	53.45 27
30.2	35.659 139	32.58 45	5.71 99	42.30 5	30.85 34	42.65 38	37.805 185	53.72 3
May 10.2	35.520 119	32.13 60	4.72 95	42.25 56	30.51 30	42.27 81	37.620 159	53.75 22
20.2	35.401 95	31.53 76	3.77 88	41.69 108	30.21 25	41.46 119	37.461 128	53.53 44
30.2	35.306 68	30.77 88	2.89 79	40.61 155	29.96 30	40.27 154	37.333 94	53.09 66
June 9.1	35.238 8	29.89 98	2.10 69	39.06 200	29.76 12	38.73 183	37.239 56	52.43 85
19.1	35.199 39	28.91 105	1.41 56	37.06 238	29.64 7	36.90 210	37.183 15	51.58 101
29.1	35.191 23	27.86 110	0.85 43	34.68 270	29.57 0	34.80 228	37.168 25	50.57 116
July 9.1	35.214 52	26.76 110	0.42 27	31.98 292	29.57 7	32.52 243	37.193 65	49.41 128
19.0	35.266 83	25.66 107	0.15 10	29.06 309	29.64 13	30.09 253	37.258 103	48.13 138
29.0	35.349 112	24.59 99	0.05 5	25.97 312	29.77 20	27.56 258	37.361 140	46.75 145
Aug. 8.0	35.461 139	23.60 86	0.10 23	22.85 305	29.97 26	24.98 256	37.501 176	45.30 153
17.9	35.600 167	22.74 67	0.33 40	19.80 291	30.23 33	22.42 262	37.677 211	43.78 156
27.9	35.767 193	22.07 46	0.73 54	16.89 262	30.56 37	19.90 242	37.888 241	42.22 159
Sept. 6.9	35.960 218	21.61 19	1.27 68	14.27 224	30.93 43	17.48 228	38.129 273	40.63 160
16.9	36.178 241	21.42 12	1.95 84	12.03 178	31.36 46	15.20 209	38.402 302	39.03 159
26.8	36.419 262	21.54 42	2.79 92	10.25 123	31.82 51	13.11 187	38.704 326	37.44 155
Oct. 6.8	36.681 281	21.96 76	3.71 104	9.02 62	32.33 54	11.24 160	39.030 350	35.89 149
16.8	36.962 296	22.72 109	4.70 104	8.40 5	32.87 56	9.64 129	39.380 368	34.40 139
26.8	37.258 306	23.81 138	5.74 105	8.45 70	33.43 58	8.35 94	39.748 381	33.01 124
Nov. 5.7	37.564 308	25.19 165	6.79 101	9.15 136	34.01 58	7.41 56	40.129 387	31.77 107
15.7	37.872 304	26.84 185	7.80 95	10.51 198	34.59 58	6.85 14	40.516 384	30.70 85
25.7	38.176 293	28.69 200	8.75 85	12.49 254	35.17 54	6.71 28	40.900 371	29.85 60
Dec. 5.6	38.469 270	30.69 209	9.60 70	15.03 301	35.71 51	6.99 71	41.271 347	29.25 31
15.6	38.739 242	32.78 210	10.30 57	18.04 340	36.22 45	7.70 112	41.618 313	28.94 3
25.6	38.981 203	34.83 204	10.87 38	21.44 366	36.67 39	8.82 148	41.931 269	28.91 27
35.6	39.184	36.92	11.25	25.10	37.06	10.30	42.200	29.18
Mean Place	33.867	17.05	7.370	13.92	27.941	36.92	35.444	54.98
Sec δ , Tan δ	1.002	-0.064	4.521	-4.410	2.062	+1.803	1.274	+0.790
$D\phi\alpha$, $D\mu\alpha$	+0.06	0.00	-0.03	-0.17	+0.10	+0.07	+0.08	+0.03
$D\phi\delta$, $D\mu\delta$	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	77 Cancri. Mag. 5.5		Groombridge 1446. Mag. 6.3		δ Hydræ. Mag. 4.2		σ Hydræ. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 27	° ' " +20 42	h m 8 30	° ' " +73 54	h m 8 33	° ' " + 5 59	h m 8 34	° ' " + 3 37
Jan. 0.6	60.691	64.86	44.08	49.89	21.313	18.84	30.674	42.01
10.6	60.899	64.25	44.61	52.08	21.511	17.34	30.871	40.39
20.5	61.057	63.85	45.00	54.54	21.661	16.02	31.021	38.93
30.5	61.162	63.68	45.21	57.21	21.761	14.91	31.121	37.67
Feb. 9.5	61.212	63.70	45.27	59.95	21.810	14.01	31.170	36.62
19.4	61.209	63.89	45.16	62.66	21.810	13.33	31.170	35.79
Mar. 1.4	61.157	64.20	44.88	65.23	21.764	12.84	31.125	35.18
11.4	61.064	64.60	44.48	67.52	21.679	12.55	31.040	34.76
21.4	60.937	65.05	43.97	69.48	21.562	12.42	30.924	34.54
31.3	60.788	65.51	43.37	71.00	21.424	12.43	30.787	34.47
Apr. 10.3	60.624	65.95	42.70	72.06	21.273	12.55	30.637	34.54
20.3	60.458	66.34	42.01	72.59	21.118	12.79	30.483	34.74
30.3	60.298	66.68	41.33	72.58	20.968	13.11	30.333	35.05
May 10.2	60.152	66.93	40.68	72.06	20.830	13.50	30.195	35.45
20.2	60.027	67.11	40.09	71.04	20.711	13.96	30.076	35.94
30.2	59.927	67.21	39.57	69.55	20.614	14.46	29.978	36.50
June 9.1	59.857	67.24	39.14	67.65	20.544	15.01	29.907	37.12
19.1	59.819	67.19	38.81	65.38	20.502	15.59	29.864	37.79
29.1	59.813	67.07	38.61	62.82	20.491	16.18	29.851	38.49
July 9.1	59.840	66.86	38.52	60.03	20.509	16.76	29.867	39.19
19.0	59.900	66.59	38.56	57.06	20.557	17.32	29.913	39.87
29.0	59.991	66.24	38.71	54.00	20.635	17.82	29.989	40.51
Aug. 8.0	60.113	65.81	38.98	50.91	20.742	18.24	30.093	41.06
18.0	60.265	65.27	39.37	47.85	20.876	18.53	30.224	41.49
27.9	60.444	64.63	39.86	44.88	21.038	18.67	30.384	41.75
Sept. 6.9	60.649	63.86	40.45	42.05	21.225	18.64	30.569	41.84
16.9	60.882	62.97	41.14	39.43	21.438	18.38	30.780	41.70
26.8	61.139	61.96	41.91	37.05	21.675	17.90	31.015	41.31
Oct. 6.8	61.418	60.83	42.74	35.00	21.935	17.17	31.273	40.65
16.8	61.718	59.60	43.63	33.29	22.214	16.21	31.550	39.73
26.8	62.034	58.28	44.56	31.98	22.510	15.00	31.845	38.55
Nov. 5.7	62.361	56.92	45.52	31.12	22.819	13.60	32.153	37.15
15.7	62.694	55.56	46.48	30.74	23.133	12.03	32.465	35.55
25.7	63.026	54.23	47.43	30.84	23.446	10.34	32.777	33.81
Dec. 5.7	63.346	52.99	48.33	31.43	23.748	8.59	33.078	31.99
15.6	63.646	51.89	49.16	32.53	24.033	6.84	33.361	30.15
25.6	63.917	50.95	49.88	34.09	24.288	5.16	33.616	28.35
35.6	64.149	50.22	50.50	36.06	24.508	3.59	33.835	26.66
Mean Place	58.183	74.01	37.430	64.14	18.998	25.87	28.382	48.68
Sec δ, Tan δ	1.069	+0.378	3.610	+3.468	1.005	+0.105	1.002	+0.063
$D\psi\alpha, D\omega\alpha$	+0.07	+0.02	+0.13	+0.14	+0.06	0.00	+0.06	0.00
$D\psi\delta, D\omega\delta$	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cancri. Mag. 4.7		δ Cancri. Mag. 4.2		α Pyridis. Mag. 3.7		ϵ Cancri. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 38	° ' " +21 45	h m 8 40	° ' " +18 26	h m 8 40	° ' " -32 53	h m 8 41	° ' " +29 3
Jan. 0.6	35.116	41.48	4.101	73.95	20.045	24.82	46.979	27.39
10.6	35.335	40.88	4.317	73.15	20.237	28.11	47.212	27.21
20.5	35.505	40.51	4.485	72.56	20.375	31.38	47.395	27.28
30.5	35.622	40.38	4.601	72.20	20.457	34.54	47.521	27.60
Feb. 9.5	35.684	40.44	4.662	72.07	20.482	37.51	47.589	28.11
19.4	35.692	40.69	4.671	72.11	20.453	40.24	47.600	28.79
Mar. 1.4	35.660	41.08	4.631	72.31	20.374	42.67	47.558	29.56
11.4	35.565	41.55	4.549	72.62	20.253	44.75	47.469	30.39
21.4	35.445	42.07	4.432	73.01	20.097	46.45	47.342	31.22
31.3	35.300	42.60	4.292	73.44	19.917	47.76	47.189	31.99
Apr. 10.3	35.140	43.11	4.136	73.87	19.721	48.68	47.017	32.67
20.3	34.973	43.57	3.976	74.28	19.519	49.17	46.840	33.21
30.3	34.813	43.95	3.819	74.65	19.318	49.25	46.667	33.62
May 10.2	34.664	44.24	3.674	74.97	19.127	48.93	46.506	33.85
20.2	34.533	44.43	3.548	75.22	18.953	48.21	46.363	33.93
30.2	34.428	44.54	3.445	75.41	18.802	47.13	46.247	33.85
June 9.1	34.351	44.55	3.369	75.54	18.676	45.71	46.160	33.60
19.1	34.303	44.47	3.322	75.60	18.578	43.98	46.105	33.21
29.1	34.288	44.30	3.307	75.59	18.514	42.01	46.084	32.69
July 9.1	34.306	44.04	3.323	75.51	18.483	39.83	46.098	32.05
19.0	34.354	43.70	3.370	75.35	18.487	37.53	46.145	31.28
29.0	34.436	43.27	3.449	75.10	18.528	35.17	46.227	30.42
Aug. 8.0	34.548	42.74	3.557	74.76	18.606	32.83	46.341	29.46
18.0	34.689	42.11	3.693	74.31	18.720	30.59	46.487	28.40
27.9	34.860	41.36	3.859	73.74	18.871	28.55	46.664	27.24
Sept. 6.9	35.058	40.50	4.051	73.03	19.057	26.79	46.870	26.00
16.9	35.283	39.52	4.271	72.18	19.278	25.37	47.104	24.68
26.8	35.534	38.42	4.515	71.19	19.532	24.39	47.367	23.29
Oct. 6.8	35.808	37.20	4.784	70.05	19.814	23.89	47.655	21.85
16.8	36.105	35.89	5.074	68.79	20.123	23.93	47.967	20.38
26.8	36.419	34.51	5.383	67.42	20.450	24.51	48.297	18.91
Nov. 5.7	36.747	33.09	5.705	65.98	20.790	25.63	48.644	17.48
15.7	37.083	31.87	6.035	64.51	21.135	27.27	48.999	16.13
25.7	37.418	30.30	6.365	63.05	21.475	29.39	49.352	14.92
Dec. 5.7	37.745	29.02	6.687	61.65	21.799	31.92	49.698	13.87
15.6	38.063	27.90	6.990	60.37	22.098	34.78	50.026	13.03
25.6	38.334	26.96	7.266	59.26	22.362	37.88	50.324	12.44
35.6	38.576	26.23	7.506	58.33	22.582	41.11	50.582	12.10
Mean Place	32.631	51.34	1.670	83.34	17.795	24.57	44.373	38.55
Sec δ , Tan δ	1.077	+0.399	1.054	+0.334	1.191	-0.647	1.144	+0.555
$D\alpha$, $D\alpha$	+0.07	+0.02	+0.07	+0.01	+0.05	-0.03	+0.07	+0.02
$D\delta$, $D\delta$	-0.3	+0.8	-0.3	+0.8	-0.3	+0.8	-0.3	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Hydræ. Mag. 3.5		δ Argus. Mag. 2.0		σ^2 Cancri (mean). Mag. 5.5		ζ Hydræ. Mag. 3.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 42	° ' " + 6 42	h m 8 42	° ' " -54 24	h m 8 49	° ' " +30 52	h m 8 51	° ' " + 6 15
	s 8	" 42	s 8	" 24	s 8	" 52	s 8	" 15
Jan. 0.6	28.412	66.41	28.751	24.60	17.368	75.12	5.938	22.58
10.6	28.618	64.92	28.967	28.35	17.613	74.99	6.150	21.04
20.5	28.777	63.62	29.107	32.17	17.806	75.15	6.318	19.69
30.5	28.887	62.53	29.172	35.96	17.942	75.55	6.436	18.56
Feb. 9.5	28.945	61.66	29.158	39.62	18.019	76.16	6.502	17.64
19.5	28.953	61.01	29.074	43.05	18.038	76.94	6.518	16.95
Mar. 1.4	28.916	60.55	28.922	46.18	18.003	77.83	6.488	16.47
11.4	28.838	60.29	28.714	48.97	17.920	78.77	6.417	16.18
21.4	28.727	60.19	28.460	51.34	17.797	79.70	6.314	16.06
31.3	28.594	60.22	28.171	53.26	17.645	80.57	6.185	16.08
Apr. 10.3	28.447	60.37	27.856	54.70	17.473	81.32	6.042	16.23
20.3	28.295	60.63	27.530	55.64	17.294	81.94	5.893	16.49
30.3	28.145	60.96	27.203	56.07	17.117	82.40	5.745	16.83
May 10.2	28.006	61.35	26.885	56.00	16.951	82.66	5.606	17.22
20.2	27.884	61.80	26.585	55.42	16.803	82.75	5.484	17.67
30.2	27.784	62.28	26.310	54.36	16.679	82.66	5.381	18.17
June 9.2	27.710	62.80	26.068	52.85	16.584	82.38	5.303	18.70
19.1	27.662	63.34	25.865	50.93	16.522	81.94	5.250	19.26
29.1	27.644	63.88	25.708	48.65	16.493	81.35	5.226	19.82
July 9.1	27.655	64.42	25.599	46.08	16.498	80.60	5.229	20.36
19.0	27.695	64.92	25.543	43.31	16.538	79.74	5.262	20.87
29.0	27.765	65.36	25.542	40.40	16.613	78.77	5.323	21.33
Aug. 8.0	27.862	65.71	25.596	37.45	16.721	77.68	5.412	21.69
18.0	27.988	65.93	25.710	34.57	16.860	76.48	5.529	21.93
27.9	28.142	66.02	25.881	31.86	17.032	75.20	5.674	22.02
Sept. 6.9	28.321	65.93	26.109	29.42	17.234	73.84	5.846	21.93
16.9	28.528	65.61	26.393	27.35	17.465	72.40	6.046	21.62
26.9	28.759	65.08	26.725	25.74	17.726	70.90	6.270	21.09
Oct. 6.8	29.014	64.31	27.100	24.67	18.013	69.35	6.520	20.31
16.8	29.290	63.30	27.510	24.20	18.326	67.79	6.792	19.30
26.8	29.583	62.07	27.948	24.35	18.658	66.25	7.084	18.05
Nov. 5.7	29.892	60.64	28.399	25.17	19.009	64.77	7.392	16.60
15.7	30.207	59.04	28.852	26.62	19.368	63.38	7.708	14.97
25.7	30.522	57.34	29.291	28.66	19.728	62.15	8.025	13.24
Dec. 5.7	30.829	55.58	29.705	31.23	20.081	61.10	8.335	11.45
15.6	31.119	53.83	30.077	34.26	20.418	60.28	8.630	9.66
25.6	31.381	52.16	30.397	37.65	20.725	59.72	8.898	7.93
35.6	31.611	50.59	30.654	41.28	20.995	59.44	9.133	6.33
Mean Place	26.120	73.85	26.153	27.62	14.758	86.99	3.677	30.20
Sec δ , Tan δ	1.007	+0.118	1.718	-1.398	1.166	+0.598	1.006	+0.110
$D\psi\alpha$, $D\omega\alpha$	+0.06	+0.01	+0.03	-0.06	+0.07	+0.03	+0.06	0.00
$D\psi\delta$, $D\omega\delta$	-0.3	+0.8	-0.3	+0.8	-0.3	+0.7	-0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington on Time.	♋ Ursa Majoris. Mag. 3.1		♌ Canori. Mag. 4.3		♍ Carinae. Mag. 5.1		♎ Ursa Majoris. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 53	° ' " +48 21	h m 8 54	° ' " +12 10	h m 8 54	° ' " -58 54	h m 8 58	° ' " +47 28
n. 0.6	39.227	37.67	2.581	24.22	60.682	41.44	5.185	39.42
10.6	39.528 ³⁰¹	38.49 ⁸²	2.802 ²²¹	23.01 ¹³¹	60.932 ²⁵⁰	45.20 ³⁷⁶	5.488 ³⁰³	40.17 ⁷⁵
20.5	39.764 ²³⁶	39.64 ¹¹⁵	2.977 ¹⁷⁵	22.00 ¹⁰¹	61.098 ¹⁶⁶	49.06 ³⁸⁶	5.727 ²³⁹	41.24 ¹⁰⁷
30.5	39.930 ¹⁶⁶	41.04 ¹⁴⁰	3.102 ¹²⁵	21.23 ⁷⁷	61.181 ⁸³	52.94 ³⁸⁸	5.898 ¹⁷¹	42.59 ¹³⁵
ab. 9.5	40.020 ⁹⁰	42.65 ¹⁶¹	3.175 ⁷³	20.67 ⁵⁶	61.179 ³	56.71 ³⁷⁷	5.996 ⁹⁸	44.15 ¹⁵⁶
	18	173	21	34	83	359	25	170
19.5	40.038	44.38	3.196	20.33	61.096	60.30	6.021	45.85
ar. 1.4	39.985 ⁵³	46.14 ¹⁷⁶	3.170 ²⁶	20.19 ¹⁴	60.939 ¹⁵⁷	63.63 ³³³	5.976 ⁴⁵	47.58 ¹⁷³
11.4	39.870 ¹¹⁵	47.85 ¹⁷¹	3.102 ⁶⁸	20.20 ¹	60.718 ³²¹	66.62 ²⁹⁹	5.871 ¹⁰⁵	49.28 ¹⁷⁰
21.4	39.703 ¹⁶⁷	49.41 ¹⁵⁶	3.000 ¹⁰²	20.34 ¹⁴	60.442 ²⁷⁶	69.22 ²⁰⁰	5.713 ¹⁵⁸	50.85 ¹⁵⁷
31.4	39.496 ²⁰⁷	50.78 ¹³⁷	2.871 ¹²⁹	20.60 ²⁶	60.125 ³¹⁷	71.38 ²¹⁶	5.515 ¹⁹⁸	52.24 ¹³⁹
	233	110	143	31	348	168	224	114
pr. 10.3	39.263	51.88	2.728	20.91	59.777	73.06	5.291	53.38
20.3	39.017 ²⁴⁶	52.68 ⁸⁰	2.577 ¹⁸¹	21.27 ³⁶	59.409 ³⁶⁸	74.24 ¹¹⁸	5.052 ²³⁹	54.22 ⁸⁴
30.3	38.770 ²⁴⁷	53.15 ⁴⁷	2.427 ¹⁵⁰	21.66 ³⁹	59.038 ³⁷¹	74.91 ⁶⁷	4.812 ²⁴⁰	54.74 ⁸²
ay 10.2	38.534 ²³⁶	53.27 ¹²	2.286 ¹⁴¹	22.05 ³⁹	58.670 ³⁶⁸	75.05 ¹⁴	4.582 ²³⁰	54.92 ¹⁸
20.2	38.320 ²¹⁴	53.05 ²³	2.162 ¹²⁴	22.44 ³⁹	58.319 ³⁵¹	74.69 ³⁶	4.373 ²⁰⁹	54.76 ¹⁶
	185	55	105	38	328	87	182	48
30.2	38.135 ¹⁴⁸	52.50 ⁸⁶	2.057 ⁸⁰	22.82 ³⁶	57.991 ²⁹⁵	73.82 ¹³⁷	4.191 ¹⁴⁷	54.28 ⁸⁰
me 9.2	37.987 ¹⁰⁸	51.64 ¹¹⁶	1.977 ⁵⁴	23.18 ³²	57.696 ²⁸⁵	72.45 ¹⁷⁸	4.044 ¹⁰⁸	53.48 ¹⁰⁹
19.1	37.879 ⁶⁴	50.48 ¹⁴⁰	1.923 ²⁵	23.50 ²⁹	57.441 ²⁵⁵	70.67 ²¹⁸	3.936 ⁶⁶	52.39 ¹³³
29.1	37.815 ¹⁹	49.08 ¹⁰³	1.898 ²	23.79 ²⁴	57.232 ¹⁵⁶	68.49 ²⁵⁰	3.870 ²²	51.06 ¹⁵⁸
ily 9.1	37.796 ²⁷	47.46 ¹⁸⁰	1.900 ³³	24.03 ¹⁹	57.076 ⁹⁷	65.99 ²⁷⁶	3.848 ²³	49.50 ¹⁷⁴
19.1	37.823	45.66	1.933	24.22	56.979	63.23	3.871	47.76
29.0	37.895 ⁷²	43.71 ¹⁹⁵	1.995 ⁶³	24.32 ¹⁰	56.944 ³⁵	60.30 ²⁹³	3.937 ⁶⁶	45.86 ¹⁹⁰
ug. 8.0	38.012 ¹¹⁷	41.65 ²⁰⁶	2.084 ⁸⁹	24.33 ¹	56.971 ²⁷	57.30 ³⁰⁰	4.048 ¹¹¹	43.83 ²⁰⁸
18.0	38.173 ¹⁶¹	39.50 ²¹⁵	2.203 ¹¹⁹	24.22 ¹¹	57.066 ⁹⁵	54.34 ²⁹⁶	4.201 ¹⁵³	41.72 ²¹¹
27.9	38.375 ²⁰²	37.31 ²¹⁹	2.349 ¹⁴⁶	23.96 ²⁶	57.227 ¹⁶¹	51.50 ²⁸⁴	4.395 ¹⁹⁴	39.56 ²¹⁶
	243	219	174	42	228	259	234	219
apt. 6.9	38.618	35.12	2.523	23.54	57.455	48.91	4.629	37.37
16.9	38.899 ²⁸¹	32.94 ²¹⁸	2.724 ²⁰¹	22.95 ⁵⁹	57.746 ²⁹¹	46.65 ²²⁶	4.903 ²⁷⁴	35.20 ²¹⁷
26.9	39.219 ³²⁰	30.83 ²¹¹	2.951 ²²⁷	22.15 ⁸⁰	58.098 ³⁵²	44.83 ¹⁸²	5.213 ³¹⁰	33.08 ²¹²
ct. 6.8	39.573 ³⁵⁴	28.81 ²⁰²	3.204 ²⁵³	21.17 ⁹⁸	58.501 ⁴⁰³	43.55 ¹²⁸	5.558 ³⁴⁵	31.04 ²⁰⁴
16.8	39.957 ⁴¹¹	26.93 ¹⁸⁸	3.480 ²⁷⁶	19.99 ¹¹⁸	58.948 ⁴⁴⁷	42.84 ⁷¹	5.934 ³⁷⁶	29.13 ¹⁹¹
		169	298	135	479	7	405	174
26.8	40.368	25.24	3.778	18.64	59.427	42.77	6.339	27.39
ov. 5.8	40.798 ⁴³⁰	23.77 ¹⁴⁷	4.088 ³¹⁰	17.14 ¹⁵⁰	59.925 ⁴⁹⁸	43.35 ⁵⁸	6.763 ⁴²⁴	25.88 ¹⁵¹
15.7	41.243 ⁴⁴⁵	22.59 ¹¹⁸	4.410 ³²³	15.55 ¹⁵⁹	60.428 ⁵⁰³	44.60 ¹²⁵	7.200 ⁴³⁷	24.63 ¹²⁵
25.7	41.687 ⁴⁴⁴	21.71 ⁸⁸	4.734 ³²⁴	13.89 ¹⁶⁶	60.919 ⁴⁹¹	46.46 ¹⁸⁶	7.640 ⁴⁴⁰	23.69 ⁹⁴
ec. 5.7	42.123 ⁴³⁶	21.19 ⁵²	5.051 ³¹⁷	12.26 ¹⁶³	61.384 ⁴⁶⁵	48.88 ²⁴²	8.073 ⁴³³	23.09 ⁶⁰
	414	15	302	159	422	293	412	22
15.6	42.537	21.04	5.353	10.67	61.806	51.81	8.485	22.87
25.6	42.916 ³⁷⁹	21.28 ²⁴	5.631 ²⁷⁸	9.19 ¹⁴⁸	62.169 ³⁶³	55.12 ³³¹	8.864 ³⁷⁹	23.03 ¹⁶
35.6	43.248 ³³²	21.89 ⁶¹	5.874 ²⁴³	7.87 ¹³²	62.465 ²⁹⁶	58.72 ³⁶⁰	9.197 ³³³	23.57 ⁵⁴
n Place	36.080	52.22	0.277	33.09	57.967	45.54	2.107	54.20
δ, Tan δ	1.505	+1.125	1.023	+0.216	1.937	-1.659	1.480	+1.090
μ, D _α	+0.08	+0.05	+0.07	+0.01	+0.03	-0.08	+0.08	+0.05
μ, D _δ	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ^3 Ursæ Majoris. Mag. 4.9		κ Canori. Mag. 5.1		λ Argus. Mag. 2.2		θ Hydre. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 3	° ' " +67 27	h m 9 3	° ' " +10 59	h m 9 4	° ' " -43 6	h m 9 10	° ' " + 2 39
Jan. 0.6	16.66	50.08	20.733	47.13	61.037	2.21	8.149	32.07
10.6	17.13	51.73	20.961	45.81	61.266	5.72	8.375	30.29
20.6	17.50	53.76	21.144	44.71	61.437	9.30	8.558	28.68
30.5	17.76	56.06	21.277	43.83	61.546	12.84	8.693	27.27
Feb. 9.5	17.90	58.56	21.359	43.18	61.591	16.26	8.777	26.09
19.5	17.91	61.13	21.390	42.76	61.576	19.48	8.811	25.13
Mar. 1.4	17.80	63.66	21.372	42.55	61.504	22.42	8.798	24.42
11.4	17.59	66.04	21.312	42.50	61.382	25.04	8.743	23.92
21.4	17.29	68.20	21.218	42.60	61.219	27.28	8.655	23.62
31.4	16.91	70.01	21.096	42.83	61.024	29.11	8.539	23.50
Apr. 10.3	16.47	71.43	20.957	43.13	60.806	30.53	8.407	23.53
20.3	16.01	72.39	20.810	43.49	60.576	31.48	8.265	23.70
30.3	15.53	72.88	20.663	43.89	60.341	31.98	8.122	24.00
May 10.3	15.07	72.86	20.523	44.30	60.111	32.01	7.985	24.39
20.2	14.65	72.36	20.396	44.72	59.892	31.58	7.861	24.87
30.2	14.25	71.40	20.289	45.14	59.692	30.72	7.753	25.42
June 9.2	13.92	70.01	20.204	45.54	59.516	29.45	7.666	26.02
19.1	13.65	68.22	20.145	45.92	59.367	27.80	7.602	26.67
29.1	13.45	66.08	20.113	46.26	59.251	25.82	7.563	27.35
July 9.1	13.34	63.67	20.107	46.56	59.170	23.57	7.551	28.03
19.1	13.30	61.01	20.131	46.79	59.128	21.12	7.567	28.69
29.0	13.36	58.19	20.183	46.95	59.125	18.52	7.609	29.30
Aug. 8.0	13.49	55.26	20.264	47.01	59.165	15.89	7.679	29.83
18.0	13.70	52.27	20.373	46.95	59.249	13.32	7.775	30.23
28.0	13.99	49.27	20.509	46.73	59.377	10.87	7.901	30.47
Sept. 6.9	14.35	46.34	20.674	46.36	59.550	8.66	8.056	30.53
16.9	14.79	43.51	20.865	45.80	59.767	6.78	8.237	30.36
26.9	15.29	40.86	21.085	45.02	60.026	5.32	8.447	29.95
Oct. 6.8	15.85	38.43	21.331	44.05	60.323	4.35	8.683	29.26
16.8	16.46	36.29	21.600	42.87	60.653	3.93	8.946	28.31
26.8	17.12	34.46	21.891	41.51	61.011	4.09	9.229	27.09
Nov. 5.8	17.81	33.03	22.201	40.00	61.388	4.85	9.532	25.63
15.7	18.52	32.03	22.521	38.36	61.774	6.20	9.846	23.95
25.7	19.23	31.50	22.844	36.66	62.158	8.11	10.165	22.12
Dec. 5.7	19.93	31.45	23.163	34.94	62.528	10.52	10.481	20.19
15.6	20.59	31.91	23.468	33.28	62.873	13.34	10.782	18.22
25.6	21.20	32.88	23.750	31.71	63.180	16.51	11.061	16.28
35.6	21.73	34.28	23.999	30.29	63.441	19.90	11.309	14.43
Mean Place	11.961	67.09	18.477	56.09	58.756	4.28	5.983	39.46
Sec δ , Tan δ	2.609	+2.410	1.019	+0.194	1.369	-0.936	1.001	+0.046
$D\psi\alpha$, $D_\omega\alpha$	+0.11	+0.12	+0.06	+0.01	+0.04	-0.04	+0.06	0.00
$D\psi\delta$, $D_\omega\delta$	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Argus. Mag. 1.8		δ Canceri. Mag. 6.6		ϵ Argus. Mag. 2.2		40 Lynceis. Mag. 3.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 12	° ' " -69 22	h m 9 14	° ' " +18 2	h m 9 14	° ' " -58 55	h m 9 16	° ' " +34 43
	s	"	s	"	s	"	s	"
Jan. 0.6	21.63	39.61	26.772	62.33	56.221	45.73	6.428	70.17
10.6	21.98 35	43.28 367	27.017 245	61.35 98	56.509 288	49.40 367	6.705 277	70.11 6
20.6	22.22 24	47.15 387	27.217 200	60.63 72	56.716 207	53.23 383	6.932 227	70.37 26
30.5	22.35 13	51.10 395	27.366 149	60.15 48	56.840 124	57.10 387	7.103 171	70.91 54
Feb. 9.5	22.35 0	55.03 393	27.463 97	59.93 22	56.880 40	60.93 383	7.212 109	71.72 81
	11	381	42	1	42	368	48	100
19.5	22.24	58.84	27.505	59.92	56.838	64.61	7.260	72.72
Mar. 1.4	22.02	62.44 360	27.499 6	60.12	56.722 116	68.05 344	7.250 10	73.87 118
	31	332	52	34	186	315	62	121
11.4	21.71	65.76 296	27.447 89	60.46 44	56.536 242	71.20 279	7.188 107	75.08 120
21.4	21.32	68.72 255	27.358 119	60.90 52	56.294 289	73.99 236	7.081 141	76.28 113
31.4	20.86 51	71.27 210	27.239 138	61.42 54	56.005 324	76.35 191	6.940 166	77.41 108
Apr. 10.3	20.35	73.37	27.101	61.96	55.681	78.26	6.774	78.44
20.3	19.81 54	74.98 161	26.952 149	62.49 53	55.334 347	79.69 143	6.594 180	79.29 85
30.3	19.24 57	76.07 109	26.801 181	63.00 51	54.975 359	80.61 92	6.410 184	79.94 65
May 10.3	18.67 57	76.63 56	26.656 145	63.45 45	54.616 359	81.01 40	6.232 178	80.38 44
20.2	18.11 56	76.63 0	26.523 133	63.83 38	54.267 349	80.90 11	6.069 163	80.58 20
	53	52	115	30	331	62	145	2
30.2	17.58	76.11	26.408	64.13	53.936	80.28	5.924	80.56
June 9.2	17.08 50	75.08 103	26.315 98	64.34 21	53.631 305	79.17 111	5.806 118	80.29 27
19.1	16.63 45	73.56 152	26.247 68	64.47 13	53.361 270	77.60 157	5.716 90	79.82 47
29.1	16.24 39	71.60 196	26.205 42	64.51 4	53.134 227	75.62 198	5.658 58	79.12 70
July 9.1	15.92 32	69.26 234	26.193 12	64.46 5	52.954 180	73.30 223	5.634 24	78.25 87
	22	267	13	15	127	263	9	106
19.1	15.70 16	66.59	26.206	64.31	52.827	70.67	5.643	77.20
29.0	15.54 4	63.70 289	26.249 43	64.04 27	52.759 68	67.85 282	5.685 42	75.99 121
Aug. 8.0	15.50 5	60.65 305	26.322 73	63.66 38	52.754 5	64.91 294	5.763 78	74.64 135
18.0	15.55 5	57.58 309	26.423 101	63.15 51	52.814 60	61.95 296	5.874 111	73.16 148
28.0	15.70 15	54.55 301	26.553 130	62.50 65	52.942 158	59.07 288	6.018 144	71.56 160
	27	284	159	80	196	267	179	168
Sept. 6.9	15.97	51.71	26.712	61.70	53.138	56.40	6.197	69.88
16.9	16.33 36	49.16 255	26.900 188	60.74 96	53.400 262	54.01 239	6.409 212	68.11 177
26.9	16.78 45	47.00 216	27.118 218	59.62 112	53.726 326	52.04 197	6.654 245	66.29 182
Oct. 6.8	17.31 53	45.32 168	27.363 245	58.35 127	54.108 382	50.56 148	6.929 275	64.44 185
16.8	17.92 61	44.20 112	27.634 271	56.94 141	54.540 432	49.64 92	7.235 306	62.60 184
	66	48	296	155	470	31	331	181
26.8	18.58	43.72	27.930	55.39	55.010	49.33	7.566	60.79
Nov. 5.8	19.27 69	43.89 17	28.244 314	53.76 163	55.507 497	49.68 35	7.921 355	59.06 178
15.7	19.97 70	44.73 84	28.572 328	52.10 166	56.015 508	50.68 100	8.289 368	57.49 157
25.7	20.66 69	46.23 150	28.906 334	50.45 165	56.519 504	52.31 163	8.666 377	56.08 141
Dec. 5.7	21.31 65	48.34 211	29.238 332	48.85 160	57.002 483	54.53 222	9.040 374	54.93 115
	60	266	320	148	447	274	360	90
15.7	21.91	51.00	29.558	47.37	57.449	57.27	9.400	54.03
25.6	22.42 51	54.12 312	29.855 297	46.05 132	57.845 396	60.44 317	9.737 337	53.45 58
35.6	22.84 42	57.61 349	30.121 266	44.95 110	58.178 333	63.98 354	10.038 301	53.20 26
Mean Place	18.333	45.65	24.485	73.16	53.594	50.62	3.868	84.28
Sec δ , Tan δ	2.840	-2.658	1.051	+0.326	1.938	-1.660	1.217	+0.693
$D_{\delta} \alpha$, $D_{\alpha} \alpha$	+0.01	-0.13	+0.07	+0.02	+0.03	-0.08	+0.07	+0.03
$D_{\delta} \delta$, $D_{\alpha} \delta$	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pyxid. Mag. 4.9		α Hydre. Mag. 2.2		λ Urse Majoris. Mag. 3.8		δ Urse Majoris. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 17	° ' -25 36	h m 9 23	° ' -8 18	h m 9 25	° ' +63 24	h m 9 27	° ' +70 10
	s	"	s	"	s	"	s	"
Jan. 0.6	53.630	59.80	35.568	14.06	8.85	58.20	20.34	71.20
10.6	53.859 ²²⁹	62.80 ³⁰⁰	35.802 ²³⁴	16.38 ²³²	9.30 ⁴⁵	59.50 ¹³⁰	20.92 ⁵⁸	72.75 ¹⁵⁵
20.6	54.041 ¹⁸²	65.80 ³⁰⁰	35.991 ¹⁸⁹	18.60 ²³²	9.68 ³⁸	61.20 ¹⁷⁰	21.38 ⁴⁶	74.72 ¹⁹⁷
30.5	54.172 ¹³¹	68.71 ²⁹¹	36.132 ¹⁴¹	20.64 ²⁰⁴	9.95 ²⁷	63.24 ²⁰⁴	21.72 ³⁴	77.02 ²³⁰
Feb. 9.5	54.249 ⁷⁷	71.46 ²⁷⁵	36.223 ⁹¹	22.50 ¹⁸⁶	10.13 ¹⁸	65.52 ²²⁸	21.93 ²¹	79.58 ²⁵⁶
	24	253	42	161	5	243	8	267
19.5	54.273	73.99	36.265	24.11	10.18	67.95	22.01	82.25
Mar. 1.5	54.247 ²⁶	76.27 ²²⁸	36.260 ⁵	25.48 ¹³⁷	10.15 ³	70.42 ²⁴⁷	21.93 ⁸	84.95 ²⁷⁰
11.4	54.179 ⁶⁸	78.23 ¹⁹⁶	36.214 ⁴⁶	26.58 ¹¹⁰	10.02 ¹³	72.81 ²³⁹	21.75 ¹⁸	87.54 ²³⁹
21.4	54.073 ¹⁰⁶	79.88 ¹⁶⁵	36.132 ⁸²	27.43 ⁸⁵	9.80 ²²	75.05 ²⁹⁴	21.45 ³⁰	89.94 ²⁴⁰
31.4	53.940 ¹³³	81.19 ¹³¹	36.022 ¹¹⁰	28.03 ⁶⁰	9.52 ²⁸	77.00 ¹⁹⁵	21.06 ³⁹	92.02 ²⁰⁸
	153	95	128	35	34	162	47	170
Apr. 10.3	53.787	82.14 ⁶⁰	35.894 ¹³⁹	28.38 ¹²	9.18	78.62 ¹²²	20.59 ⁵¹	93.72 ¹²⁶
20.3	53.621 ¹⁶⁶	82.74 ²⁴	35.755 ¹⁴³	28.50 ⁹	8.81 ³⁷	79.84 ⁷⁸	20.08 ⁵⁴	94.98 ¹⁷⁷
30.3	53.453 ¹⁶⁸	82.98 ¹¹	35.612 ¹³⁹	28.41 ³⁰	8.42 ³⁹	80.62 ³¹	19.54 ⁵⁴	95.75 ²⁶
May 10.3	53.288 ¹⁶⁵	82.87 ⁴⁴	35.473 ¹³⁰	28.11 ⁴⁸	8.03 ³⁷	80.93 ¹⁵	19.00 ⁵¹	96.01 ⁹⁴
20.2	53.132 ¹⁴¹	82.43 ⁷⁶	35.343 ¹¹⁵	27.63 ⁶⁷	7.66 ³⁴	80.78 ⁶²	18.49 ⁴⁸	95.77 ⁷⁶
30.2	52.991	81.67	35.228	26.96	7.32	80.16	18.01	95.01
June 9.2	52.870 ¹²¹	80.60 ¹⁰⁷	35.130 ⁹⁸	26.15 ⁸¹	7.02 ³⁰	79.10 ¹⁰⁶	17.58 ⁴³	93.79 ¹²²
19.2	52.770 ¹⁰⁰	79.27 ¹³³	35.054 ⁷⁶	25.21 ⁹⁴	6.77 ²⁵	77.64 ¹⁴⁶	17.22 ³⁶	92.13 ¹⁶⁶
29.1	52.696 ⁷⁴	77.70 ¹⁵⁷	35.000 ⁵⁴	24.16 ¹⁰⁵	6.58 ¹⁹	75.82 ¹⁸³	16.93 ³⁹	90.08 ²⁰⁵
July 9.1	52.648 ⁴⁸	75.95 ¹⁷⁵	34.971 ²⁹	23.03 ¹¹³	6.45 ¹³	73.68 ²¹⁴	16.72 ²¹	87.71 ²⁸⁷
	17	188	3	116	6	241	12	266
19.1	52.631	74.07	34.968	21.87	6.39	71.27	16.60	85.03
29.0	52.644 ¹³	72.12 ¹⁹⁵	34.992 ²⁴	20.70 ¹¹⁷	6.40 ¹	68.64 ²⁶³	16.58 ²	82.15 ²⁶⁸
Aug. 8.0	52.688 ⁴⁴	70.16 ¹⁹⁶	35.043 ⁵¹	19.59 ¹¹¹	6.47 ⁷	65.86 ²⁷⁸	16.65 ⁷	85.10 ³⁰⁵
18.0	52.766 ⁷⁸	68.26 ¹⁹⁰	35.123 ⁸⁰	18.57 ¹⁰²	6.61 ¹⁴	62.96 ²⁹⁰	16.80 ¹⁵	75.95 ³¹⁵
28.0	52.877 ¹¹¹	66.52 ¹⁷⁴	35.232 ¹⁰⁹	17.71 ⁸⁶	6.81 ²⁰	60.01 ²⁹⁵	17.04 ²⁴	72.76 ³¹⁹
	145	152	137	65	27	295	33	316
Sept. 6.9	53.022	65.00	35.369	17.06	7.08	57.06	17.37	69.60
16.9	53.201 ¹⁷⁹	63.77 ¹²⁸	35.538 ¹⁶⁹	16.66 ⁴⁰	7.42 ³⁴	54.17 ²⁹⁹	17.80 ⁴³	66.53 ³⁰⁷
26.9	53.414 ²¹³	62.90 ⁸⁷	35.736 ¹⁹⁸	16.56 ¹⁰	7.81 ³⁹	51.38 ²⁷⁹	18.30 ⁵⁰	63.59 ²⁹⁴
Oct. 6.9	53.659 ²⁴⁵	62.45 ⁴⁵	35.963 ²²⁷	16.80 ²⁴	8.26 ⁴⁵	48.77 ²⁶¹	18.87 ⁵⁷	60.86 ²⁷³
16.8	53.933 ³⁰¹	62.47 ⁵⁰	36.218 ²⁵⁵	17.39 ⁵⁹	8.77 ⁵⁴	46.38 ²³⁹	19.51 ⁶⁴	58.41 ²⁴⁵
			279	94		211	70	213
26.8	54.234	62.97	36.497	18.33	9.31	44.27 ¹⁷⁶	20.21	56.28 ¹⁷⁴
Nov. 5.8	54.554 ³²⁰	63.96 ⁹⁹	36.797 ³⁰⁰	19.62 ¹²⁹	9.91 ⁶⁰	42.51 ¹³⁷	20.95 ⁷⁴	54.54 ¹³¹
15.7	54.886 ³³²	65.43 ¹⁴⁷	37.110 ³¹³	21.24 ¹⁶²	10.52 ⁶¹	41.14 ⁹⁴	21.73 ⁷⁸	53.23 ⁸³
25.7	55.222 ³³⁶	67.32 ¹⁸⁹	37.430 ³²⁰	23.13 ¹⁸⁹	11.14 ⁶²	40.20 ⁴⁶	22.52 ⁷⁹	52.41 ³⁰
Dec. 5.7	55.553 ³³¹	69.61 ²²⁹	37.747 ³¹⁷	25.24 ²¹¹	11.76 ⁶²	39.74 ⁵	23.31 ⁷⁹	52.11 ²³
	314	259	305	225	59	102	75	126
15.7	55.867	72.20	38.052	27.49	12.35	39.78	24.06	52.34
25.6	56.156 ²⁸⁹	75.01 ²⁸¹	38.336 ²⁸⁴	29.83 ²³⁴	12.91 ⁵⁶	40.32 ⁵⁴	24.77 ⁷¹	53.11 ⁷⁷
35.6	56.408 ²⁵²	77.96 ²⁹⁵	38.588 ²⁵²	32.16 ²³³	13.40 ⁴⁹	41.34 ¹⁰²	25.40 ⁶³	54.37 ¹²⁶
Mean Place	51.535	58.68	33.499	8.96	4.950	76.73	15.533	90.37
Sec δ , Tan δ	1.109	-0.480	1.011	-0.146	2.234	+1.998	2.951	+2.776
$D\mu\alpha$, $D\mu\delta$	+0.05	-0.02	+0.06	-0.01	+0.09	+0.10	+0.11	+0.15
$D\varphi\delta$, $D\omega\delta$	-0.3	+0.7	-0.3	+0.6	-0.3	+0.6	-0.3	+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

	θ Ursa Majoris. Mag. 3.3			ψ Argus. Mag. 3.6			ξ Leonis. Mag. 5.1			10 Leonis Minoris. Mag. 4.6		
Washington Time.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "
	9	27	+52 2	9	27	-40 6	9	27	+11 39	9	29	+36 45
	s		"	s		"	s		"	s		"
a. 0.6	26.010		49.33	30.201		25.11	33.846		39.14	14.864		29.43
10.6	26.366 ³⁵⁶		50.06 ⁷³	30.454 ²⁵³		28.48 ³³⁷	34.094 ²⁴⁸		37.76 ¹³⁸	15.159 ²⁹⁵		29.39 ⁴
20.6	26.659 ²⁹³		51.18 ¹¹²	30.653 ¹⁹⁹		31.94 ²⁴⁶	34.299 ²⁰⁵		36.62 ¹¹⁴	15.405 ²⁴⁶		29.70 ³¹
30.5	26.879 ²²⁰		52.64 ¹⁴⁶	30.792 ¹³⁹		35.40 ³⁴⁶	34.456 ¹⁵⁷		35.72 ⁹⁰	15.592 ¹⁸⁷		30.32 ⁶²
b. 9.5	27.021 ¹⁴²		54.37 ¹⁷³	30.872 ⁸⁰		38.76 ³³⁶	34.562 ¹⁰⁶		35.07 ⁶⁵	15.719 ¹²⁷		31.21 ⁸⁹
	65		191	22		318	55		42	66		111
19.5	27.086		56.28	30.894		41.94	34.617		34.65	15.785		32.32
r. 1.5	27.073 ¹³		58.28 ²⁰⁰	30.859 ³⁵		44.89 ²⁹⁵	34.623 ⁶		34.46 ¹⁹	15.790 ⁵		33.58 ¹²⁶
11.4	26.990 ⁸³		60.28 ²⁰⁰	30.774 ⁸⁵		47.53 ²⁶⁴	34.585 ³⁸		34.46 ⁰	15.740 ⁵⁰		34.93 ¹³⁵
21.4	26.844 ¹⁴⁶		62.18 ¹⁹⁰	30.647 ¹²⁷		49.82 ²²⁹	34.509 ⁷⁶		34.61 ¹⁵	15.643 ⁹⁷		36.27 ¹³⁴
31.4	26.648 ¹⁹⁶		63.89 ¹⁷¹	30.486 ¹⁶¹		51.74 ¹⁹²	34.405 ¹⁰⁴		34.90 ²⁹	15.507 ¹³⁶		37.56 ¹²⁹
	232		147	186		151	126		37	163		115
r. 10.3	26.416		65.36	30.300		53.25	34.279		35.27	15.344		38.71
20.3	26.160 ²⁵⁶		66.52 ¹¹⁶	30.099 ²⁰¹		54.33 ¹⁰⁸	34.141 ¹³⁸		35.69 ⁴²	15.165 ¹⁷⁹		39.69 ⁹⁸
30.3	25.894 ²⁶⁶		67.32 ⁸⁰	29.890 ²⁰⁹		54.97 ⁶⁴	33.999 ¹⁴²		36.15 ⁴⁶	14.979 ¹⁸⁶		40.46 ⁷⁷
y 10.3	25.630 ²⁶⁴		67.75 ⁴³	29.680 ²¹⁰		55.18 ²¹	33.861 ¹³⁸		36.62 ⁴⁷	14.796 ¹⁸³		40.99 ⁵³
20.2	25.380 ²⁵⁰		67.79 ⁴	29.478 ²⁰²		54.95 ²³	33.732 ¹²⁹		37.08 ⁴⁶	14.625 ¹⁷¹		41.26 ²⁷
	228		34	189		65	114		44	154		2
30.2	25.152		67.45	29.289		54.30	33.618		37.52	14.471		41.28
ne 9.2	24.955 ¹⁹⁷		66.73 ⁷²	29.119 ¹⁷⁰		53.25 ¹⁰⁵	33.523 ⁹⁵		37.93 ⁴¹	14.340 ¹³¹		41.04 ²⁴
19.2	24.795 ¹⁶⁰		65.66 ¹⁰⁷	28.971 ¹⁴⁸		51.83 ¹⁴²	33.451 ⁷²		38.30 ³⁷	14.238 ¹⁰²		40.56 ⁷¹
29.1	24.675 ¹²⁰		64.29 ¹³⁷	28.851 ¹²⁰		50.07 ¹⁷⁶	33.401 ⁵⁰		38.62 ³²	14.165 ⁷⁰		39.85 ⁴⁸
ly 9.1	24.601 ⁷⁴		62.62 ¹⁶⁷	28.761 ⁹⁰		48.03 ²⁰⁴	33.378 ²³		38.87 ²⁵	14.125 ⁴³		38.90 ⁹⁵
	30		191	56		225	2		18	6		114
19.1	24.571		60.71	28.705		45.78	33.380		39.05	14.119		37.76
29.0	24.588 ¹⁷		58.58 ²¹³	28.683 ²²		43.37 ²⁴¹	33.410 ³⁰		39.14 ⁹	14.147 ²³		36.45 ¹³¹
g. 8.0	24.652 ⁶⁴		56.30 ²²⁸	28.701 ¹⁸		40.90 ²⁴⁷	33.468 ⁵⁸		39.11 ³	14.209 ⁶²		34.98 ¹⁴⁷
18.0	24.763 ¹¹¹		53.88 ²⁴²	28.759 ⁵⁸		38.43 ²⁴⁷	33.552 ⁸⁴		38.96 ¹⁵	14.305 ⁹⁶		33.35 ¹⁶³
28.0	24.921 ¹⁵⁸		51.37 ²⁵¹	28.859 ¹⁰⁰		36.07 ²³⁶	33.665 ¹¹³		38.65 ³¹	14.437 ¹³²		31.61 ¹⁷⁴
	204		256	143		215	141		47	167		184
pt. 6.9	25.125		48.81	29.002		33.92	33.806		38.18	14.604		29.77
16.9	25.375 ²⁵⁰		46.25 ²⁵⁶	29.188 ¹⁸⁶		32.06 ¹⁸⁶	33.978 ¹⁷²		37.51 ⁶⁷	14.806 ²⁰²		27.84 ¹⁹³
26.9	25.669 ²⁰⁴		43.74 ²⁵¹	29.416 ²²⁸		30.58 ¹⁴⁸	34.178 ²⁰⁰		36.65 ⁸⁶	15.042 ²³⁶		25.86 ¹⁹⁸
t. 6.9	26.006 ³³⁷		41.30 ²⁴⁴	29.685 ²⁶⁹		29.54 ¹⁰⁴	34.406 ²²⁸		35.58 ¹⁰⁷	15.312 ²⁷⁰		23.85 ²⁰¹
16.8	26.381 ³⁷⁵		39.00 ²³⁰	29.990 ³⁰⁵		29.03 ⁵¹	34.663 ²⁵⁷		34.31 ¹²⁷	15.614 ³⁰²		21.85 ²⁰⁰
	412		210	335		4	281		145	331		194
26.8	26.793		36.90	30.325		29.07	34.944		32.86	15.945		19.91
v. 5.8	27.234 ⁴⁴¹		35.04 ¹⁸⁶	30.685 ³⁶⁰		29.68 ⁶¹	35.248 ³⁰⁴		31.24 ¹⁶²	16.301 ³⁵⁶		18.06 ¹⁸⁵
15.7	27.696 ⁴⁶²		33.48 ¹⁵⁶	31.059 ³⁷⁴		30.87 ¹¹⁹	35.566 ³¹⁸		29.52 ¹⁷²	16.675 ³⁷⁴		16.37 ¹⁶⁹
25.7	28.169 ⁴⁷³		32.27 ¹²¹	31.438 ³⁷⁹		32.60 ¹⁷³	35.892 ³²⁶		27.73 ¹⁷⁹	17.060 ³⁸⁵		14.88 ¹⁴⁹
c. 5.7	28.641 ⁴⁷²		31.45 ⁸²	31.809 ³⁷¹		34.83 ²²³	36.218 ³²⁶		25.93 ¹⁸⁰	17.445 ³⁸⁵		13.65 ¹²³
	457		39	351		266	316		174	374		95
15.7	29.098		31.06	32.180		37.49	36.534		24.19	17.819		12.70
25.6	29.526 ⁴²⁸		31.10 ⁴	32.481 ³²¹		40.50 ³⁰¹	36.831 ²⁹⁷		22.56 ¹⁶³	18.170 ³⁵¹		12.11 ⁵⁹
35.6	29.911 ³⁸⁵		31.56 ⁴⁶	32.761 ²⁸⁰		43.75 ³²⁵	37.098 ²⁶⁷		21.08 ¹⁴⁸	18.488 ³¹⁸		11.85 ²⁶
Place	22.944		66.80	28.041		27.21	31.684		49.04	12.336		44.67
Tan δ	1.626		+1.282	1.308		-0.842	1.021		+0.206	1.248		+0.747
D_{α}	+0.08		+0.07	+0.05		-0.04	+0.06		+0.01	+0.07		+0.04
D_{δ}	-0.3		+0.6	-0.3		+0.6	-0.3		+0.6	-0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Leonis. Mag. 3.8		θ Antiles. Mag. 5.0		δ Leonis. Mag. 3.1		υ Argus Mag. 3.	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	
	h m 9 36	° ' " +10 15	h m 9 40	° ' " -27 23	h m 9 41	° ' " +24 8	h m 9 45	
Jan. 0.6	48.688 ²⁵³	48.12 ¹⁴⁷	34.772 ²⁶²	37.14 ³⁰¹	14.234 ²⁷⁵	55.25 ⁷⁸	5.93 ³⁸	2
10.6	48.936 ²¹²	46.65 ¹²⁵	35.024 ³⁰⁶	40.15 ³⁰⁴	14.509 ²³²	54.47 ⁴⁹	6.31 ³⁰	2
20.6	49.148 ¹⁶⁵	45.40 ¹⁰²	35.230 ¹⁵⁶	43.19 ³⁰⁰	14.741 ¹⁸²	53.98 ¹⁷	6.61 ²⁰	2
30.5	49.313 ¹¹⁴	44.38 ⁷⁵	35.386 ¹⁰³	46.19 ²⁶⁶	14.923 ¹²⁹	53.81 ⁹	6.81 ¹¹	3
Feb. 9.5	49.427 ⁶⁴	43.63 ⁵¹	35.489 ⁴⁹	49.05 ²⁶⁷	15.052 ⁷⁴	53.90 ³⁶	6.92 ¹	3
19.5	49.491 ¹⁵	43.12 ²⁸	35.538 ¹	51.72 ²⁴³	15.126 ²⁰	54.26 ⁵⁵	6.93 ⁹	4
Mar. 1.5	49.506 ³⁰	42.84 ⁸	35.537 ⁴⁶	54.15 ²¹³	15.146 ²⁸	54.81 ⁷²	6.84 ¹⁷	4
11.4	49.476 ⁶⁷	42.76 ⁹	35.491 ⁸⁶	56.28 ¹⁸⁴	15.118 ⁷⁰	55.53 ⁸⁰	6.67 ²³	5
21.4	49.409 ⁹⁷	42.85 ²⁴	35.405 ¹¹⁶	58.12 ¹⁴⁹	15.048 ¹⁰⁴	56.33 ⁸⁵	6.44 ³¹	5
31.4	49.312 ¹²⁰	43.09 ³³	35.289 ¹⁴⁰	59.61 ¹¹⁵	14.944 ¹²⁹	57.18 ⁸⁵	6.13 ³⁵	5
Apr. 10.4	49.192 ¹³³	43.42 ⁴¹	35.149 ¹⁵⁴	60.76 ⁷⁹	14.815 ¹⁴⁴	58.03 ⁷⁹	5.78 ³⁹	5
20.3	49.059 ¹³⁸	43.83 ⁴⁶	34.995 ¹⁶²	61.55 ⁴⁴	14.671 ¹⁵²	58.82 ⁷⁰	5.39 ⁴¹	5
30.3	48.921 ¹³⁶	44.29 ⁴⁸	34.833 ¹⁶³	61.99 ⁷	14.519 ¹⁵¹	59.52 ⁶⁰	4.98 ⁴³	6
May 10.3	48.785 ¹²⁹	44.77 ⁴⁸	34.670 ¹⁵⁸	62.06 ²⁷	14.368 ¹⁴³	60.12 ⁴⁶	4.55 ⁴³	6
20.2	48.656 ¹¹⁴	45.25 ⁴⁸	34.512 ¹⁴⁷	61.79 ⁶¹	14.225 ¹²⁹	60.58 ³¹	4.12 ⁴²	6
30.2	48.542 ⁹⁸	45.73 ⁴⁵	34.365 ¹⁸¹	61.18 ⁹¹	14.096 ¹¹⁰	60.89 ¹⁶	3.70 ⁴⁰	6
June 9.2	48.444 ⁷⁶	46.18 ⁴²	34.234 ¹¹³	60.27 ¹²¹	13.986 ⁸⁹	61.05 ⁰	3.30 ³⁷	6
19.2	48.368 ⁵⁵	46.60 ³⁸	34.121 ⁹⁰	59.06 ¹⁴⁶	13.897 ⁶⁴	61.05 ¹⁵	2.93 ³⁴	5
29.1	48.313 ³⁰	46.98 ³³	34.031 ⁶⁶	57.60 ¹⁶⁸	13.833 ³⁸	60.90 ³²	2.59 ²⁸	5
July 9.1	48.283 ⁶	47.31 ²³	33.965 ⁴⁰	55.92 ¹⁸⁴	13.795 ¹⁰	60.58 ⁴⁵	2.31 ²²	5
19.1	48.277 ²¹	47.54 ¹⁶	33.925 ¹⁰	54.08 ¹⁹³	13.785 ¹⁷	60.13 ⁶¹	2.09 ¹⁶	5
29.1	48.298 ⁴⁷	47.70 ⁵	33.915 ²⁰	52.15 ¹⁹⁸	13.802 ⁴⁶	59.52 ⁷⁷	1.93 ⁸	5
Aug. 8.0	48.345 ⁷⁵	47.75 ⁸	33.935 ⁵³	50.17 ¹⁹³	13.848 ⁷⁶	58.75 ⁹¹	1.85 ¹	4
18.0	48.420 ¹⁰⁴	47.67 ²⁴	33.988 ⁸⁷	48.24 ¹⁸³	13.924 ¹⁰⁷	57.84 ¹⁰⁷	1.84 ⁸	4
28.0	48.524 ¹³¹	47.43 ⁴¹	34.075 ¹²³	46.41 ¹⁶³	14.031 ¹³⁶	56.77 ¹²²	1.92 ¹⁵	4
Sept. 6.9	48.655 ¹⁶¹	47.02 ⁶¹	34.198 ¹⁵⁹	44.78 ¹³⁷	14.167 ¹⁶⁹	55.55 ¹³⁶	2.07 ²⁴	3
16.9	48.816 ¹⁹¹	46.41 ⁸²	34.357 ¹⁹⁶	43.41 ¹⁰¹	14.336 ²⁰¹	54.19 ¹⁵⁰	2.31 ³³	3
26.9	49.007 ²²¹	45.59 ¹⁰³	34.553 ²³⁰	42.40 ⁶²	14.537 ²³¹	52.69 ¹⁶³	2.64 ⁴²	3
Oct. 6.9	49.228 ²⁵⁰	44.56 ¹²⁵	34.783 ²⁶⁵	41.78 ¹⁶	14.768 ²⁶³	51.06 ¹⁷³	3.06 ⁴⁷	3
16.8	49.478 ²⁷⁶	43.31 ¹⁴⁴	35.048 ²⁹⁵	41.62 ³²	15.031 ²⁹¹	49.33 ¹⁷⁹	3.53 ⁵³	3
26.8	49.754 ²⁹⁸	41.87 ¹⁶²	35.343 ³¹⁸	41.94 ⁸²	15.322 ³¹⁶	47.54 ¹⁸⁴	4.06 ⁵⁸	3
Nov. 5.8	50.052 ³¹⁵	40.25 ¹⁷⁵	35.681 ³³⁵	42.76 ¹³¹	15.638 ³³⁴	45.70 ¹⁸¹	4.64 ⁵⁹	2
15.8	50.367 ³²⁵	38.50 ¹⁸³	35.996 ³⁴⁴	44.07 ¹⁷⁶	15.972 ³⁴⁶	43.89 ¹⁷⁵	5.23 ⁶¹	3
25.7	50.692 ³²⁷	36.67 ¹⁸⁶	36.340 ³⁴²	45.83 ²¹⁶	16.318 ³⁴⁹	42.14 ¹⁶²	5.84 ⁵⁹	3
Dec. 5.7	51.019 ³¹⁸	34.81 ¹⁸²	36.682 ³³⁰	47.99 ²⁵¹	16.667 ³⁴¹	40.52 ¹⁴⁴	6.43 ⁵⁶	3
15.7	51.337 ³⁰⁰	32.99 ¹⁷²	37.012 ³⁰⁶	50.50 ²⁷⁶	17.008 ³²⁴	39.08 ¹²¹	6.99 ⁵⁰	3
25.6	51.637 ²⁷²	31.27 ¹⁵⁷	37.318 ²⁷⁴	53.26 ²⁹³	17.332 ²⁹⁴	37.87 ⁹⁵	7.49 ⁴³	3
35.6	51.909	29.70	37.592	56.19	17.626	36.92	7.92	4
Mean Place	46.575	57.96	32.753	36.67	12.003	68.52	3.190	2
Sec δ, Tan δ	1.016	+0.181	1.126	-0.518	1.096	+0.448	2.340	-
Dψ α, D _α α	+0.06	+0.01	+0.05	-0.03	+0.07	+0.02	+0.03	-
Dψ δ, D _δ δ	-0.3	+0.6	-0.3	+0.6	-0.3	+0.6	-0.3	+

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	U Ursae Majoris. Mag. 3.9			6 Sextantis. Mag. 6.0			μ Leonis. Mag. 4.1			Groombridge 1586. Mag. 6.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 9 45	s 436	° ' " +59 24	h m 9 47	s 253	° ' " - 3 51	h m 9 48	s 285	° ' " +26 23	h m 9 51	s 283	° ' " +73 15
Jan. 0.6	13.647		71.08	8.150		36.84	8.394		23.59	10.02		51.58
10.6	14.083	436	72.00 92	8.402	253	38.99 215	8.679	285	22.89 70	10.72	70	52.99 141
20.6	14.448	365	73.36 136	8.614	212	41.02 203	8.920	241	22.49 40	11.32	60	54.87 188
30.6	14.730	282	75.10 174	8.781	167	42.86 184	9.112	192	22.41 8	11.78	46	57.15 228
Feb. 9.5	14.924	194	77.14 204	8.898	117	44.49 168	9.249	137	22.64 23	12.07	29	59.73 258
		100	224		69	141		82	47	15		275
19.5	15.024		79.38	8.967		45.90	9.331		23.11	12.22		62.48
Mar. 1.5	15.032	8	81.74 236	8.988	21	47.04 114	9.359	28	23.80 69	12.22	0	65.31 283
11.4	14.953	79	84.09 235	8.966	22	47.94 90	9.337	22	24.63 83	12.05	17	68.09 278
21.4	14.797	156	86.34 225	8.907	59	48.59 65	9.271	66	25.57 94	11.75	30	70.69 260
31.4	14.577	220	88.38 204	8.818	89	49.03 44	9.171	100	26.54 97	11.34	41	73.03 234
		272	175		111	21		129	95	51		197
Apr. 10.4	14.305		90.13	8.707		49.24	9.042		27.49	10.83		75.00
20.3	13.998	307	91.56 143	8.582	125	49.27 3	8.896	149	28.38 89	10.25	58	76.53 153
30.3	13.672	326	92.57 101	8.450	132	49.12 15	8.743	153	29.16 78	9.62	63	77.58 105
May 10.3	13.341	331	93.15 58	8.318	132	48.81 31	8.588	155	29.80 64	8.98	64	78.10 52
20.2	13.019	322	93.29 30	8.191	127	48.36 45	8.440	148	30.29 49	8.34	64	78.09 1
		301			114	58		135	39	60		53
30.2	12.718		92.99	8.077		47.78	8.305		30.59	7.74		77.56
June 9.2	12.448	270	92.25 74	7.975	102	47.09 69	8.189	116	30.73 14	7.18	56	76.53 108
19.2	12.217	231	91.10 115	7.892	83	46.31 78	8.093	96	30.69 4	6.68	50	75.02 151
29.1	12.031	186	89.57 153	7.829	63	45.45 96	8.022	71	30.46 28	6.27	41	73.07 195
July 9.1	11.896	136	87.71 186	7.787	42	44.57 88	7.976	46	30.08 38	5.94	33	70.75 232
		83	217		18	91		18	56	24		266
19.1	11.812		85.54	7.769		43.66	7.958		29.52	5.70		68.09
29.1	11.785	27	83.14 240	7.775	6	42.77 89	7.968	10	28.78 74	5.58	12	65.16 263
Aug. 8.0	11.815	30	80.52 262	7.807	32	41.94 88	8.006	38	27.88 90	5.56	2	62.02 314
18.0	11.903	88	77.75 277	7.866	59	41.23 71	8.076	70	26.83 105	5.64	8	58.75 327
28.0	12.049	146	74.89 286	7.953	87	40.65 58	8.175	99	25.62 121	5.83	19	55.40 335
		208	292		117	39		131	136	30		337
Sept. 6.9	12.252		71.97	8.070		40.26	8.306		24.26	6.13		52.03
16.9	12.511	259	69.06 291	8.216	146	40.11 15	8.471	165	22.76 150	6.53	40	48.71 332
26.9	12.827	316	66.20 286	8.395	179	40.23 12	8.667	196	21.12 164	7.08	50	45.51 320
Oct. 6.9	13.196	369	63.45 275	8.605	210	40.64 41	8.895	228	19.37 175	7.62	59	42.51 300
16.8	13.617	421	60.88 257	8.845	240	41.38 74	9.156	261	17.54 183	8.30	68	39.75 276
		466	235		268	105		289	189	77		243
26.8	14.083		58.53	9.113		42.43	9.445		15.65	9.07		37.32
Nov. 5.8	14.588	505	56.49 204	9.403	290	43.78 135	9.762	317	13.75 190	9.90	83	35.27 205
15.8	15.123	535	54.79 170	9.713	310	45.42 164	10.098	336	11.88 187	10.77	87	33.67 160
25.7	15.674	561	53.50 129	10.033	320	47.29 187	10.448	350	10.11 177	11.67	90	32.56 111
Dec. 5.7	16.229	555	52.66 84	10.356	323	49.33 204	10.802	354	8.49 162	12.57	90	31.99 57
		543	35		314	217		348	143	89		0
15.7	16.772		52.31	10.670		51.50	11.150		7.06	13.46		31.99
25.6	17.286	514	52.45 14	10.968	298	53.71 221	11.481	331	5.89 117	14.30	84	32.55 56
35.6	17.755	499	53.09 64	11.240	272	55.89 218	11.785	304	5.00 89	15.06	76	33.64 109
Mean Place	10.324		90.68	6.161		30.38	6.172		37.64	5.021		72.74
Sec δ, Tan δ	1.966		+1.692	1.002		-0.067	1.116		+0.496	8.473		+3.326
D _α α, D _α α	+0.09		+0.09	+0.06		0.00	+0.07		+0.03	+0.11		+0.19
D _δ δ, D _δ δ	-0.3		+0.6	-0.3		+0.5	-0.3		+0.5	-0.3		+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	19 Leonis Minoris. Mag. 5.2		ϕ Argus. Mag. 3.7		π Leonis. Mag. 4.9		77 Leonis. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 52	° ' " +41 26	h m 9 53	° ' " -54 10	h m 9 55	° ' " + 8 25	h m 10 2	° ' " +17 9
Jan. 0.6	42.562	31.22	61.145	32.69	54.898	67.61	53.906	34.70
10.6	42.893 ³³¹	31.22 ⁰	61.474 ³²⁹	36.12 ³⁴³	55.164 ²⁶⁶	66.00 ¹⁶¹	54.086 ²⁸⁰	33.47 ¹²⁸
20.6	43.173 ²⁸⁰	31.63 ⁴¹	61.739 ²⁶⁵	39.76 ³⁶⁴	55.390 ²²⁶	64.58 ¹⁴²	54.327 ²⁴¹	32.50 ⁹⁷
30.6	43.397 ²²⁴	32.41 ⁷⁸	61.932 ¹⁹⁸	43.52 ³⁷⁶	55.571 ¹⁸¹	63.41 ¹¹⁷	54.522 ¹⁹⁵	31.83 ⁶⁷
Feb. 9.5	43.559 ¹⁶²	33.50 ¹⁰⁹	62.053 ¹²¹	47.28 ³⁷⁶	55.704 ¹³³	62.51 ⁹⁰	54.667 ¹⁴⁵	31.43 ⁴⁰
	96	134	48	367	82	65	92	11
19.5	43.655	34.84	62.101	50.95	55.786	61.86	54.759	31.32
Mar. 1.5	43.687 ³²	36.37 ¹⁵³	62.078 ²³	54.45 ³⁵⁰	55.820 ³⁴	61.45 ⁴¹	54.802 ⁴³	31.45 ¹²
11.4	43.659 ²⁸	38.00 ¹⁶³	61.992 ⁸⁶	57.72 ³²⁷	55.809 ¹¹	61.27 ¹⁸	54.797 ⁵	31.78 ³³
21.4	43.578 ⁸¹	39.64 ¹⁶⁴	61.848 ¹⁴⁴	60.67 ²⁰⁵	55.759 ⁵⁰	61.27 ⁰	54.753 ⁴⁴	32.27 ⁴⁹
31.4	43.453 ¹²⁵	41.22 ¹⁵⁸	61.659 ¹⁸⁰	63.26 ²⁵⁹	55.677 ⁸²	61.44 ¹⁷	54.672 ⁸¹	32.87 ⁶⁰
	160	144	220	218	105	30	106	66
Apr. 10.4	43.293	42.66	61.430	65.44	55.572	61.74	54.566	33.53
20.3	43.111 ¹⁸²	43.91 ¹²⁵	61.173 ²⁵⁷	67.19 ¹⁷⁵	55.450 ¹²²	62.13 ³⁰	54.441 ¹²⁵	34.22 ⁶⁹
30.3	42.916 ¹⁹⁵	44.92 ¹⁰¹	60.898 ²⁷⁵	68.46 ¹²⁷	55.320 ¹³⁰	62.58 ⁴⁵	54.308 ¹³³	34.90 ⁶⁸
May 10.3	42.718 ¹⁹²	45.65 ⁷³	60.614 ²⁸⁴	69.25 ⁷⁹	55.189 ¹⁸¹	63.07 ⁴²	54.172 ¹³⁶	35.53 ⁶⁸
20.3	42.526 ¹⁶⁸	46.06 ⁴³	60.329 ²⁸⁵	69.54 ²⁹	55.063 ¹²⁶	63.59 ⁵³	54.040 ¹³²	36.10 ⁵⁷
	170	12	278	21	115	52	122	48
30.2	42.347	46.20	60.051	69.33	54.948	64.11	53.918	36.58
June 9.2	42.190 ¹⁵⁷	46.00 ²⁰	59.788 ²⁶³	68.64 ⁶⁹	54.846 ¹⁰²	64.62 ⁵¹	53.809 ¹⁰⁹	36.96 ³⁸
19.2	42.057 ¹³³	45.51 ⁴⁹	59.545 ²⁴³	67.49 ¹¹⁵	54.761 ⁸⁵	65.11 ⁴⁹	53.717 ⁹²	37.23 ²⁷
29.1	41.954 ¹⁰³	44.71 ⁸⁰	59.331 ²¹⁴	65.91 ¹⁵⁸	54.696 ⁶⁵	65.56 ⁴⁵	53.645 ⁷²	37.40 ¹⁷
July 9.1	41.882 ⁷²	43.65 ¹⁰⁶	59.150 ¹⁸¹	63.95 ¹⁹⁶	54.652 ⁴⁴	65.95 ³⁹	53.595 ⁵⁰	37.44 ⁴
	39	129	143	228	20	33	27	8
19.1	41.843	42.36	59.007	61.67	54.632	66.28	53.568	37.36
29.1	41.838 ⁵	40.84 ¹⁵²	58.910 ⁹⁷	59.12 ²⁵⁵	54.635 ³	66.52 ²⁴	53.565 ³	37.13 ²³
Aug. 8.0	41.870 ³²	39.10 ¹⁷⁴	58.862 ⁴⁸	56.41 ²⁷¹	54.663 ²⁶	66.65 ¹³	53.590 ²⁵	36.76 ³⁷
18.0	41.938 ⁶⁸	37.21 ¹⁸⁹	58.868 ⁶	53.61 ²⁸⁰	54.719 ⁵⁶	66.65 ⁰	53.640 ⁵⁰	36.24 ³²
28.0	42.044 ¹⁰⁶	35.16 ²⁰⁵	58.932 ⁶⁴	50.83 ²⁷⁸	54.801 ⁸²	66.49 ¹⁶	53.719 ⁷⁹	35.55 ⁶⁹
	143	217	123	265	112	34	110	87
Sept. 7.0	42.187	32.99	59.055	48.18	54.913	66.15	53.829	34.68
16.9	42.369 ¹⁸²	30.74 ²²⁵	59.240 ¹⁸⁵	45.74 ²⁴⁴	55.055 ¹⁴²	65.61 ⁵⁴	53.968 ¹³⁰	33.64 ¹⁰⁴
26.9	42.590 ²²¹	28.44 ²³⁰	59.484 ²⁴⁴	43.63 ²¹¹	55.229 ¹⁷⁴	64.84 ⁷⁷	54.141 ¹⁷³	32.41 ¹²²
Oct. 6.9	42.850 ²⁶⁰	26.12 ²³²	59.785 ³⁰¹	41.95 ¹⁶⁸	55.434 ²⁰⁵	63.86 ⁹⁸	54.345 ²⁰⁴	31.00 ¹⁴¹
16.8	43.147 ²⁹⁷	23.82 ²³⁰	60.140 ³⁵⁵	40.78 ¹¹⁷	55.670 ²³⁶	62.63 ¹²³	54.583 ²³⁸	29.41 ¹⁵⁹
	330	222	401	61	265	143	267	171
26.8	43.477	21.60	60.541	40.17	55.935	61.20	54.850	27.70
Nov. 5.8	43.839 ³⁶²	19.52 ²⁰⁸	60.977 ⁴³⁶	40.18 ¹	56.225 ²⁹⁰	59.56 ¹⁶⁴	55.145 ²⁹⁵	25.87 ¹⁵³
15.8	44.223 ³⁸⁴	17.62 ¹⁹⁰	61.436 ⁴⁵⁹	40.81 ⁶³	56.535 ³¹⁰	57.77 ¹⁷⁹	55.461 ³¹⁶	23.97 ¹⁹⁰
25.7	44.624 ⁴⁰¹	15.97 ¹⁶⁵	61.906 ⁴⁷⁰	42.06 ¹²⁵	56.859 ³²⁴	55.88 ¹⁸⁹	55.793 ³²²	22.06 ¹⁹¹
Dec. 5.7	45.032 ⁴⁰⁸	14.61 ¹³⁶	62.372 ⁴⁶⁶	43.93 ¹⁸⁷	57.187 ³²⁸	53.94 ¹⁹⁴	56.131 ³³⁸	20.20 ¹⁸⁶
	401	101	444	239	323	192	335	176
15.7	45.433	13.60	62.816	46.32	57.510	52.02	56.466	18.44
25.7	45.815 ³⁸²	12.97 ⁶³	63.226 ⁴¹⁰	49.17 ²⁸⁵	57.817 ³⁰⁷	50.17 ¹⁸⁵	56.787 ³²¹	16.86 ¹⁵⁸
35.6	46.167 ³⁵²	12.75 ²²	63.590 ³⁶⁴	52.40 ³²³	58.100 ²⁸³	48.46 ¹⁷¹	57.083 ²⁹⁶	15.46 ¹⁴⁰
Mean Place	40.082	48.59	58.862	38.22	52.892	77.49	51.769	47.06
Sec δ , Tan δ	1.334	+0.883	1.709	-1.386	1.011	+0.148	1.047	+0.309
$D\phi\alpha$, $D\alpha$	+0.07	+0.05	+0.04	-0.08	+0.06	+0.0	+0.06	+0.02
$D\phi\delta$, $D\delta$	-0.3	+0.5	-0.3	+0.5	-0.3	+0.5	-0.3	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Leonis. (Regulus.) Mag. 1.3		λ Hydræ. Mag. 3.8		η Velorum. Mag. 4.1		32 Ursæ Majoris. Mag. 5.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 4	° ' +12 21	h m 10 6	° ' -11 56	h m 10 11	° ' -41 42	h m 10 12	° ' +65 30
Jan. 0.6	2.412	55.33	37.317	58.01	19.390	51.62	9.28	43.00
10.6	2.686 ²⁷⁴	53.86 ¹⁴⁷	37.583 ²⁶⁶	60.48 ²⁴⁷	19.695 ³⁰⁵	54.82 ³²⁰	9.84 ⁵⁶	43.89 ⁸⁹
20.6	2.923 ²³⁷	52.64 ¹²²	37.810 ²²⁷	62.90 ²⁴²	19.952 ²⁵⁷	58.19 ³³⁷	10.31 ⁴⁷	45.28 ¹³⁹
30.6	3.114 ¹⁹¹	51.68 ⁹⁶	37.992 ¹⁸²	65.19 ²²⁹	20.152 ²⁰⁰	61.63 ³⁴⁴	10.69 ³⁸	47.10 ¹⁸²
Feb. 9.5	3.257 ¹⁴³	51.00 ⁶⁸	38.126 ¹³⁴	67.30 ²¹¹	20.293 ¹⁴¹	65.05 ³⁴²	10.97 ²⁸	49.29 ²¹⁹
19.5	3.347 ⁹⁰	50.57 ⁴³	38.212 ⁸⁶	69.20 ¹⁹⁰	20.376 ⁸³	68.36 ³³¹	11.13 ¹⁶	51.74 ²⁴⁵
Mar. 1.5	3.389 ⁴²	50.41 ¹⁶	38.249 ³⁷	70.85 ¹⁶⁵	20.401 ²⁵	71.49 ³¹³	11.20 ⁷	54.35 ²⁶¹
11.5	3.387 ²	50.45 ⁴	38.243 ⁶	72.25 ¹⁴⁰	20.373 ²⁸	74.39 ²⁹⁰	11.15 ⁵	56.98 ²⁶³
21.4	3.344 ⁴³	50.69 ²⁴	38.199 ⁴⁴	73.37 ¹¹²	20.298 ⁷⁵	76.99 ²⁸⁰	11.00 ¹⁵	59.53 ²⁵⁵
31.4	3.266 ⁷⁸	51.06 ³⁷	38.122 ⁷⁷	74.24 ⁸⁷	20.183 ¹¹⁵	79.25 ²²⁶	10.77 ²³	61.92 ²³⁹
Apr. 10.4	3.165 ¹⁰¹	51.53 ⁴⁷	38.022 ¹⁰⁰	74.84 ⁹⁰	20.037 ¹⁴⁶	81.15 ¹⁹⁰	10.45 ³²	64.02 ²¹⁰
20.3	3.045 ¹²⁰	52.06 ⁵³	37.904 ¹¹⁸	75.20 ³⁶	19.866 ¹⁷¹	82.65 ¹⁵⁰	10.09 ³⁶	65.76 ¹⁷⁴
30.3	2.916 ¹²⁹	52.63 ⁵⁷	37.776 ¹²⁸	75.31 ¹¹	19.680 ¹⁸⁶	83.73 ¹⁰⁸	9.69 ⁴⁰	67.09 ¹³³
May 10.3	2.784 ¹³²	53.20 ⁵⁷	37.646 ¹³⁰	75.20 ¹¹	19.485 ¹⁹⁵	84.38 ⁶⁵	9.28 ⁴¹	67.96 ⁸⁷
20.3	2.656 ¹²⁸	53.75 ⁵⁵	37.517 ¹²⁹	74.87 ³³	19.288 ¹⁹⁷	84.60 ²²	8.87 ⁴¹	68.35 ³⁹
30.2	2.538 ¹¹⁸	54.27 ⁵²	37.395 ¹²²	74.35 ⁵²	19.095 ¹⁹³	84.39 ²¹	8.46 ⁴¹	68.24 ¹¹
June 9.2	2.432 ¹⁰⁶	54.73 ⁴⁶	37.285 ¹¹⁰	73.63 ⁷²	18.911 ¹⁸⁴	83.77 ⁶²	8.08 ³⁸	67.65 ⁵⁹
19.2	2.342 ⁹⁰	55.13 ⁴⁰	37.188 ⁹⁷	72.76 ⁸⁷	18.742 ¹⁶⁹	82.75 ¹⁰²	7.75 ³³	66.59 ¹⁰⁶
29.2	2.272 ⁷⁰	55.46 ³³	37.109 ⁷⁹	71.76 ¹⁰⁰	18.592 ¹⁵⁰	81.36 ¹³⁹	7.46 ²⁹	65.10 ¹⁴⁹
July 9.1	2.222 ⁵⁰	55.69 ²³	37.049 ⁶⁰	70.65 ¹¹¹	18.465 ¹²⁷	79.64 ¹⁷²	7.22 ²⁴	63.21 ¹⁸⁹
19.1	2.195 ²⁷	55.84 ¹⁵	37.010 ³⁹	69.46 ¹¹⁹	18.365 ¹⁰⁰	77.65 ¹⁹⁹	7.04 ¹⁸	60.95 ²²⁶
29.1	2.190 ⁵	55.87 ³	36.994 ¹⁶	68.24 ¹²²	18.297 ⁶⁸	75.43 ²²²	6.93 ¹¹	58.39 ²⁵⁶
Aug. 8.0	2.212 ²²	55.78 ⁹	37.003 ⁹	67.05 ¹¹⁹	18.263 ³⁴	73.08 ²³⁵	6.88 ⁵	55.59 ²⁸⁰
18.0	2.260 ⁴⁸	55.53 ²⁵	37.040 ³⁷	65.92 ¹¹³	18.269 ⁶	70.67 ²⁴¹	6.91 ³	52.58 ³⁰¹
28.0	2.336 ⁷⁶	55.13 ⁴⁰	37.106 ⁶⁶	64.91 ¹⁰¹	18.315 ⁴⁶	68.28 ²³⁹	7.00 ⁹	49.45 ³¹³
Sept. 7.0	2.442 ¹⁰⁶	54.55 ⁵⁸	37.201 ⁹⁵	64.07 ⁸⁴	18.407 ⁹²	66.01 ²²⁷	7.18 ¹⁸	46.23 ³²²
16.9	2.577 ¹³⁵	53.77 ⁷⁸	37.330 ¹²⁹	63.49 ⁵⁸	18.545 ¹³⁸	63.96 ²⁰⁵	7.43 ²⁵	42.99 ³²⁴
26.9	2.745 ¹⁶⁸	52.79 ⁹⁸	37.492 ¹⁶²	63.18 ³¹	18.731 ¹⁸⁶	62.21 ¹⁷⁵	7.74 ³¹	39.79 ³²⁹
Oct. 6.9	2.945 ²⁰⁰	51.59 ¹²⁰	37.689 ¹⁹⁷	63.18 ⁰	18.964 ²³³	60.86 ¹³⁵	8.12 ³⁸	36.71 ³⁰⁸
16.9	3.177 ²³²	50.20 ¹³⁹	37.918 ²²⁹	63.55 ³⁷	19.241 ²⁷⁷	59.96 ⁹⁰	8.57 ⁴⁵	33.79 ²⁹²
26.8	3.439 ²⁶²	48.61 ¹⁵⁹	38.178 ²⁶⁰	64.30 ⁷⁵	19.559 ³¹⁸	59.58 ³⁸	9.08 ⁵¹	31.13 ²⁶⁶
Nov. 5.8	3.727 ²⁸⁸	46.88 ¹⁷³	38.465 ²⁸⁷	65.41 ¹¹¹	19.911 ³⁵²	59.76 ¹⁸	9.65 ⁵⁷	28.76 ²³⁷
15.8	4.039 ³¹²	45.03 ¹⁸⁵	38.775 ³¹⁰	66.88 ¹⁴⁷	20.237 ³⁷⁶	60.51 ⁷⁵	10.27 ⁶²	26.78 ¹⁹⁸
25.7	4.364 ³²⁵	43.12 ¹⁹¹	39.097 ³²⁵	68.67 ¹⁷⁹	20.678 ³⁹¹	61.82 ¹³¹	10.91 ⁶⁴	25.24 ¹⁵⁴
Dec. 5.7	4.695 ³³¹	41.19 ¹⁹³	39.425 ³²⁸	70.74 ²⁰⁷	21.072 ³⁹⁴	63.68 ¹⁸⁸	11.56 ⁶⁵	24.19 ¹⁰⁵
15.7	5.024 ³²⁹	39.32 ¹⁸⁷	39.749 ³²⁴	73.00 ²²⁶	21.457 ³⁸⁵	65.97 ²²⁹	12.21 ⁶⁵	23.66 ⁵³
25.7	5.339 ³¹⁵	37.57 ¹⁷⁵	40.057 ³⁰⁸	75.40 ²⁴⁰	21.819 ³⁶²	68.69 ²⁷²	12.83 ⁶²	23.69 ³
35.6	5.630 ²⁹¹	35.99 ¹⁵⁸	40.340 ²⁸³	77.86 ²⁴⁶	22.148 ³²⁹	71.73 ³⁰⁴	13.41 ⁵⁸	24.27 ⁵⁸
Mean Place	0.419	66.46	35.428	53.62	17.400	55.08	5.828	64.97
Sec δ , Tan δ	1.024	+0.219	1.022	-0.212	1.340	-0.892	2.412	+2.195
$D\psi\alpha$, $D\omega\alpha$	+0.06	+0.01	+0.06	-0.01	+0.05	-0.05	+0.09	+0.13
$D\psi\delta$, $D\omega\delta$	-0.3	+0.5	-0.3	+0.5	-0.4	+0.5	-0.4	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Leonis. Mag. 3.6			λ Ursæ Majoris. Mag. 3.5			γ Leonis <i>pr.</i> Mag. 2.6			μ Ursæ Majoris. Mag. 3.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	"	h m	s	"	h m	s	"	h m	s	"
	10 12		+23 49	10 12		+43 18	10 15		+20 14	10 17		+41 54
Jan. 0.7	10.030		20.90	11.902		69.31	29.243		71.01	29.329		25.99
10.6	10.327	297	19.93	12.255	353	69.25	29.537	294	69.85	29.680	351	25.81
20.6	10.584	257	19.27	12.561	306	69.61	29.792	255	68.99	29.986	306	26.07
30.6	10.796	212	18.95	12.812	251	70.39	30.002	210	68.45	30.239	253	26.74
Feb. 9.5	10.956	160	18.94	12.999	187	71.51	30.163	161	68.21	30.430	191	27.77
19.5	11.062	106	19.23	13.122	123	72.92	30.272	109	68.25	30.557	127	29.09
Mar. 1.5	11.116	54	19.75	13.178	56	74.56	30.329	57	68.56	30.621	64	30.64
11.5	11.120	4	20.48	13.171	7	76.31	30.338	9	69.07	30.622	1	32.35
21.4	11.080	40	21.34	13.109	62	78.11	30.304	34	69.75	30.568	54	34.11
31.4	11.002	78	22.28	12.998	111	79.87	30.233	71	70.52	30.467	101	35.84
Apr. 10.4	10.897	105	23.24	12.850	148	81.49	30.135	98	71.35	30.329	138	37.46
20.4	10.769	128	24.17	12.673	177	82.94	30.015	120	72.18	30.161	168	38.91
30.3	10.631	138	25.04	12.479	194	84.13	29.884	131	72.98	29.976	185	40.13
May 10.3	10.488	143	25.79	12.278	201	85.04	29.748	136	73.70	29.784	192	41.09
20.3	10.348	140	26.41	12.079	199	85.63	29.614	134	74.33	29.591	193	41.74
30.2	10.215	133	26.89	11.889	190	85.88	29.487	127	74.84	29.407	184	42.06
June 9.2	10.097	118	27.19	11.715	174	85.82	29.373	114	75.22	29.239	168	42.07
19.2	9.993	104	27.33	11.563	152	85.40	29.273	100	75.44	29.089	150	41.74
29.2	9.910	83	27.29	11.438	125	84.68	29.192	81	75.53	28.964	125	41.10
July 9.1	9.849	61	27.07	11.341	97	83.65	29.132	60	75.47	28.867	97	40.16
19.1	9.811	38	26.68	11.276	65	82.34	29.094	38	75.24	28.800	67	38.94
29.1	9.799	12	26.12	11.245	31	80.76	29.081	13	74.86	28.765	35	37.46
Aug. 8.0	9.814	15	25.37	11.250	5	78.97	29.094	13	74.32	28.763	2	35.74
18.0	9.855	41	24.45	11.290	40	76.97	29.132	38	73.59	28.797	34	33.82
28.0	9.927	72	23.35	11.369	79	74.79	29.200	68	72.70	28.868	71	31.71
Sept. 7.0	10.030	103	22.09	11.487	118	72.48	29.298	98	71.64	28.978	110	29.46
16.9	10.165	135	20.65	11.646	159	70.07	29.428	130	70.38	29.127	149	27.09
26.9	10.334	169	19.05	11.847	201	67.58	29.591	163	68.96	29.317	190	24.64
Oct. 6.9	10.538	204	17.31	12.089	242	65.07	29.789	198	67.36	29.548	231	22.15
16.9	10.775	237	15.45	12.372	283	62.57	30.019	230	65.62	29.820	272	19.66
26.8	11.045	270	13.50	12.693	321	60.16	30.282	263	63.76	30.131	311	17.23
Nov. 5.8	11.345	300	11.50	13.050	357	57.87	30.575	293	61.81	30.477	346	14.91
15.8	11.668	323	9.49	13.434	384	55.78	30.891	316	59.82	30.852	375	12.78
25.7	12.009	341	7.54	13.840	406	53.94	31.225	334	57.84	31.249	397	10.88
Dec. 5.7	12.359	350	5.71	14.255	415	52.42	31.568	343	55.95	31.657	408	9.28
15.7	12.707	348	4.07	14.670	415	51.27	31.911	343	54.19	32.066	409	8.04
25.7	13.043	336	2.64	15.069	399	50.53	32.242	331	52.63	32.460	394	7.19
35.6	13.356	313	1.50	15.443	374	50.21	32.551	309	51.31	32.830	370	6.77
Mean Place	7.980		35.26	9.527		88.05	27.249		84.56	27.031		44.70
Sec δ , Tan δ	1.093		+0.441	1.375		+0.943	1.066		+0.369	1.344		+0.898
$D\psi a$, $D_{\omega} a$	+0.07		+0.03	+0.07		+0.06	+0.07		+0.02	+0.07		+0.05
$D\psi \delta$, $D_{\omega} \delta$	-0.4		+0.5	-0.4		+0.5	-0.4		+0.4	-0.4		+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 H. Ursæ Majoris. Mag. 4.9		μ Hydræ. Mag. 4.1		31 Leonis Minoris. Mag. 4.4		α Antilæ. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 18	° ' " +65 58	h m 10 22	° ' " -16 25	h m 10 23	° ' " +37 7	h m 10 23	° ' " -30 38
	s	"	s	"	s	"	s	"
Jan. 0.7	17.92	31.72	9.256	5.09	11.015	22.07	25.708	59.95
10.6	18.49 57	32.55 83	9.536 280	7.70 261	11.352 337	21.62 45	26.002 294	62.90 295
20.6	18.98 49	33.91 136	9.777 241	10.28 258	11.648 296	21.60 2	26.255 253	65.96 306
30.6	19.38 40	35.71 180	9.975 198	12.78 250	11.893 245	21.97 37	26.460 205	69.03 307
Feb. 9.5	19.68 30	37.89 218	10.125 150	15.14 236	12.081 188	22.70 73	26.613 153	72.03 300
	18	244	100	215	130	104	101	287
19.5	19.86	40.33	10.225	17.29	12.211	23.74	26.714	74.90
Mar. 1.5	19.93 7	42.96 263	10.278 53	19.23 194	12.280 69	25.04 130	26.762 48	77.57 267
11.5	19.90 3	45.62 266	10.286 8	20.90 167	12.291 11	26.60 146	26.763 1	80.01 244
21.4	19.76 14	48.22 260	10.255 31	22.31 141	12.251 40	28.05 155	26.721 42	82.15 214
31.4	19.52 24	50.65 243	10.190 65	23.43 112	12.166 85	29.61 156	26.643 78	84.00 185
	30	216	91	85	122	151	107	150
Apr. 10.4	19.22	52.81	10.099	24.28	12.044	31.12	26.536	85.50
20.4	18.86 36	54.62 181	9.990 109	24.85 57	11.897 147	32.49 137	26.407 129	86.66 116
30.3	18.46 40	56.02 140	9.866 124	25.16 31	11.732 165	33.68 119	26.264 143	87.46 80
May 10.3	18.04 42	56.96 94	9.738 128	25.21 5	11.559 173	34.65 97	26.112 152	87.91 45
20.3	17.62 42	57.42 46	9.608 130	25.00 21	11.387 172	35.35 70	25.958 154	88.00 9
	41	4	125	43	166	44	151	27
30.2	17.21	57.38	9.483	24.57	11.221	35.79	25.807	87.73
June 9.2	16.82 39	56.85 58	9.367 116	23.90 67	11.067 154	35.92 13	25.663 144	87.13 60
19.2	16.46 36	55.84 101	9.262 105	23.05 85	10.931 136	35.76 16	25.530 133	86.21 92
29.2	16.15 31	54.39 145	9.171 91	22.02 103	10.817 114	35.33 43	25.413 117	84.99 122
July 9.1	15.91 24	52.54 185	9.098 73	20.83 119	10.726 91	34.60 73	25.313 100	83.52 147
	20	223	54	128	68	96	77	169
19.1	15.71 13	50.31	9.044	19.55	10.663	33.62	25.236	81.83
29.1	15.58 7	47.76 255	9.012 32	18.20 135	10.629 34	32.39 123	25.182 54	79.99 184
Aug. 8.1	15.51 1	44.96 280	9.004 8	16.83 137	10.624 5	30.94 145	25.158 24	78.04 195
18.0	15.52 1	41.95 301	9.024 20	15.50 133	10.652 28	29.26 168	25.164 6	76.07 197
28.0	15.60 8	38.79 316	9.072 48	14.28 122	10.714 62	27.41 185	25.205 41	74.15 192
	15	325	80	107	97	202	77	180
Sept. 7.0	15.75	35.54	9.152	13.21	10.811	25.39	25.282	72.35
16.9	15.99 24	32.26 328	9.267 115	12.36 85	10.946 135	23.22 217	25.399 117	70.77 158
26.9	16.29 30	29.01 325	9.417 150	11.79 57	11.120 174	20.95 227	25.557 158	69.48 129
Oct. 6.9	16.67 38	25.86 315	9.602 185	11.55 24	11.333 213	18.60 235	25.757 200	68.54 94
16.9	17.11 44	22.89 297	9.823 221	11.69 14	11.585 252	16.21 239	25.996 239	68.02 52
	51	275	256	52	290	237	276	5
26.8	17.62	20.14	10.079	12.21	11.875	13.84	26.272	67.97
Nov. 5.8	18.19 57	17.71 243	10.363 284	13.13 92	12.198 323	11.53 231	26.582 310	68.41 44
15.8	18.80 61	15.66 205	10.673 310	14.45 132	12.551 353	9.36 217	26.916 334	69.36 95
25.8	19.45 65	14.04 162	10.999 326	16.13 168	12.925 374	7.37 199	27.269 353	70.78 142
Dec. 5.7	20.12 67	12.91 113	11.333 334	18.14 201	13.312 387	5.64 173	27.628 359	72.65 187
	66	50	331	225	387	143	354	227
15.7	20.78	12.32	11.664	20.39	13.699	4.21	27.982	74.92
25.7	21.42 64	12.28 4	11.983 319	22.83 244	14.077 378	3.14 107	28.322 340	77.51 259
35.6	22.02 60	12.80 52	12.278 295	25.38 255	14.430 353	2.47 67	28.634 312	80.33 282
Mean Place	14.521	54.11	7.437	1.99	8.856	40.02	23.857	60.86
Sec δ , Tan δ	2.457	+2.244	1.043	-0.295	1.254	+0.757	1.163	-0.593
$D_{\alpha} \alpha$, $D_{\alpha} \alpha$	+0.09	+0.14	+0.06	-0.02	+0.07	+0.05	+0.05	-0.04
$D_{\delta} \delta$, $D_{\delta} \delta$	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	36 Ursæ Majoris. Mag. 4.8		9 H. Draconis. Mag. 5.0		ρ Leonis. Mag. 3.8		33 Sextantis. Mag. 6.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 25	° ' " +56 23	h m 10 28	° ' " +76 7	h m 10 28	° ' " + 9 43	h m 10 37	° ' " - 1 18
	s 10 25	" +56 23	s 10 28	" +76 7	s 10 28	" + 9 43	s 10 37	" - 1 18
Jan. 0.7	26.111	43.73	14.71	45.89	31.566	33.53	15.649	43.38
10.6	26.559 ⁴⁴⁸	44.11 ³⁸	15.82 ⁹¹	46.96 ¹⁰⁷	31.854 ²⁸⁸	31.87 ¹⁶⁶	15.937 ²⁸⁸	45.47 ²⁰⁹
20.6	26.951 ³⁹²	44.99 ⁸⁸	16.42 ⁸⁰	48.58 ¹⁶²	32.107 ²⁵³	30.43 ¹⁴⁴	16.190 ²⁵³	47.45 ¹⁹⁶
30.6	27.275 ³²⁴	46.32 ¹³³	17.07 ⁶⁵	50.68 ²¹⁰	32.318 ²¹¹	29.25 ¹¹⁸	16.402 ²¹²	49.23 ¹⁷⁸
Feb. 9.6	27.521 ²⁴⁶	48.05 ¹⁷³	17.55 ⁴⁸	53.16 ²⁴⁸	32.483 ¹⁶⁵	28.34 ⁹¹	16.569 ¹⁶⁷	50.78 ¹⁵⁶
	19.5	27.686 ¹⁴⁵	50.09 ²⁰⁴	17.85 ³⁰	55.91 ²⁷⁵	32.599 ¹¹⁶	27.73 ⁶¹	16.689 ¹²⁰
Mar. 1.5	27.766 ⁸⁰	52.33 ²²⁴	17.96 ¹¹	58.82 ²⁹¹	32.666 ⁶⁷	27.37 ³⁶	16.762 ⁷³	52.10 ¹⁰⁴
11.5	27.763 ³	54.68 ²³⁵	17.90 ⁶	61.76 ²⁹⁴	32.688 ²²	27.26 ¹¹	16.791 ²⁹	53.14 ⁸⁰
21.4	27.687 ⁷⁶	57.03 ²³⁵	17.67 ²³	64.62 ²⁸⁶	32.669 ¹⁹	27.35 ⁹	16.779 ¹²	54.50 ⁵⁶
31.4	27.542 ¹⁴⁵	59.28 ²²⁵	17.26 ⁴¹	67.27 ²⁶⁵	32.615 ⁵⁴	27.62 ²⁷	16.734 ⁴⁵	54.83 ³³
	198	205	52	235	82	40	73	13
Apr. 10.4	27.344	61.33	16.74	69.62	32.533	28.02	16.661	54.96
20.4	27.104 ²⁴⁰	63.11 ¹⁷⁸	16.10 ⁶⁴	71.57 ¹⁹⁵	32.431 ¹⁰²	28.52 ⁵⁰	16.569 ⁹²	54.92 ⁴
30.3	26.834 ²⁷⁰	64.57 ¹⁴⁶	15.39 ⁷¹	73.06 ¹⁴⁹	32.316 ¹¹⁵	29.08 ⁵⁶	16.462 ¹⁰⁷	54.71 ²¹
May 10.3	26.549 ²⁸⁵	65.62 ¹⁰⁵	14.63 ⁷⁶	74.04 ⁹⁸	32.194 ¹²²	29.66 ⁵⁸	16.348 ¹¹⁴	54.37 ³⁴
20.3	26.261 ²⁸⁸	66.27 ⁶⁵	13.84 ⁷⁹	74.48 ⁴⁴	32.072 ¹²²	30.25 ⁵⁹	16.232 ¹¹⁶	53.94 ⁴³
	282	20	77	11	116	58	114	58
30.3	25.979	66.47	13.07	74.37	31.956	30.83	16.118	53.41
June 9.2	25.715 ²⁶⁴	66.24 ²³	12.32 ⁷⁵	73.73 ⁶⁴	31.848 ¹⁰⁸	31.38 ⁵⁵	16.011 ¹⁰⁷	52.80 ⁶¹
19.2	25.474 ²⁴¹	65.57 ⁶⁷	11.63 ⁶⁹	72.56 ¹¹⁷	31.751 ⁹⁷	31.87 ⁴⁹	15.914 ⁹⁷	52.14 ⁶⁶
29.2	25.266 ²⁰⁸	64.50 ¹⁰⁷	11.01 ⁶²	70.91 ¹⁶⁵	31.670 ⁸¹	32.31 ⁴⁴	15.829 ⁸⁵	51.43 ⁷¹
July 9.1	25.094 ¹⁷²	63.05 ¹⁴⁵	10.48 ⁵³	68.80 ²¹¹	31.607 ²¹¹	32.68 ³⁷	15.760 ⁶⁹	50.71 ⁷²
	180	180	42	249	45	26	53	66
19.1	24.964 ⁸⁷	61.25 ²¹²	10.06 ³²	66.31 ²⁸²	31.562 ²³	32.94 ¹⁶	15.707 ³²	50.02 ⁶⁴
29.1	24.877 ³⁹	59.13 ²³⁹	9.74 ²¹	63.49 ³¹²	31.539 ¹	33.10 ⁴	15.675 ¹²	49.34 ⁶¹
Aug. 8.1	24.838 ¹¹	56.74 ²⁶²	9.53 ⁸	60.37 ³³²	31.538 ²⁵	33.14 ¹⁰	15.663 ¹³	48.73 ⁵⁰
18.0	24.849 ⁶²	54.12 ²⁷⁹	9.45 ⁶	57.05 ³⁴⁸	31.563 ⁵⁰	33.04 ²⁸	15.676 ³⁸	48.23 ³⁷
28.0	24.911 ¹¹⁴	51.33 ²⁹²	9.51 ¹⁷	53.57 ³⁵⁴	31.613 ⁸⁰	32.76 ⁴⁵	15.714 ⁶⁹	47.86 ¹⁹
Sept. 7.0	25.025	48.41	9.68	50.03	31.693	32.31	15.783	47.67
17.0	25.193 ¹⁶⁸	45.41 ³⁰⁰	9.99 ³¹	46.47 ³⁵⁶	31.804 ¹¹¹	31.64 ⁶⁷	15.882 ⁹⁹	47.69 ²
26.9	25.417 ²²⁴	42.39 ³⁰²	10.42 ⁴³	42.98 ³⁴⁹	31.947 ¹⁴³	30.76 ⁸⁸	16.015 ¹³³	47.96 ²⁷
Oct. 6.9	25.696 ²⁷⁹	39.40 ²⁹⁹	10.99 ⁵⁷	39.62 ³³⁶	32.125 ¹⁷⁸	29.65 ¹¹¹	16.183 ¹⁶⁸	48.49 ⁵³
16.9	26.028 ³³²	36.50 ²⁹⁰	11.66 ⁶⁷	36.47 ⁸¹⁵	32.337 ²¹²	28.33 ¹³²	16.386 ²⁰³	49.31 ⁸²
	383	274	79	286	244	155	237	113
26.8	26.411	33.76	12.45	33.61	32.581	26.78	16.623	50.43
Nov. 5.8	26.840 ⁴²⁹	31.26 ²⁵⁰	13.33 ⁸⁸	31.10 ²⁵¹	32.855 ²⁷⁴	25.06 ¹⁷²	16.890 ²⁶⁷	51.82 ¹³⁰
15.8	27.307 ⁴⁶⁷	29.05 ²²¹	14.30 ⁹⁷	29.02 ²⁰⁸	33.156 ³⁰¹	23.18 ¹⁸⁸	17.185 ²⁹⁵	53.48 ¹⁶⁶
25.8	27.804 ⁴⁹⁷	27.20 ¹⁸⁵	15.32 ¹⁰²	27.44 ¹⁵⁸	33.475 ³¹⁹	21.20 ²⁰²	17.499 ³¹⁴	55.35 ¹⁸⁷
Dec. 5.7	28.316 ⁵¹²	25.78 ¹⁴²	16.37 ¹⁰⁵	26.39 ¹⁰⁵	33.804 ³²⁹	19.18 ²⁰²	17.824 ³²⁵	57.39 ²⁰⁴
	515	95	105	45	331	200	328	215
15.7	28.831	24.83	17.42	25.94	34.135	17.18	18.152	59.54
25.7	29.332 ⁵⁰¹	24.39 ⁴⁴	18.45 ¹⁰³	26.09 ¹⁵	34.458 ³²³	15.27 ¹⁹¹	18.471 ³¹⁹	61.71 ²¹⁷
35.7	29.803 ⁴⁷¹	24.48 ⁹	19.40 ⁹⁵	26.83 ⁷⁴	34.759 ³⁰¹	13.50 ¹⁷⁷	18.771 ³⁰⁰	63.84 ²¹³
Mean Place	23.431	65.36	9.927	69.58	29.720	44.46	13.889	35.65
Sec δ , Tan δ	1.807	+1.505	4.171	+4.050	1.015	+0.171	1.000	-0.023
$D\mu\alpha$, $D\mu\delta$	+0.08	+0.09	+0.10	+0.25	+0.06	+0.01	+0.06	0.00
$D\mu\delta$, $D\mu\delta$	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON

Washington Mean Time.	41 Leonis Minoris. Mag. 5.0		θ Argus. Mag. 3.0		42 Leonis Minoris. Mag. 5.4		γ Argus. Var. 1.6-6.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 38	° ' " +23 36	h m 10 40	° ' " -63 57	h m 10 41	° ' " +31 6	h m 10 41	° ' " -59 15
	s	"	s	"	s	"	s	"
Jan. 0.7	59.521	50.00	3.93	45.91	20.494	35.22	54.690	3.58
10.6	59.832	48.86	4.41	48.98	20.824	34.38	55.124	6.65
20.6	60.110	48.06	4.82	52.40	21.119	33.93	55.496	10.06
30.6	60.345	47.60	5.15	56.06	21.368	33.87	55.798	13.68
Feb. 9.6	60.590	47.49	5.39	59.86	21.566	34.19	56.021	17.43
	134	22	15	386	142	66	144	378
19.5	60.664	47.71	5.54	63.72	21.708	34.85	56.165	21.21
Mar. 1.5	60.747	48.19	5.61	67.54	21.796	35.78	56.233	24.92
11.5	60.779	48.92	5.58	71.23	21.831	36.93	56.226	28.49
21.4	60.766	49.81	5.47	74.69	21.816	38.23	56.151	31.85
31.4	60.715	50.81	5.30	77.89	21.758	39.60	56.015	34.92
	85	106	23	286	91	138	187	272
Apr. 10.4	60.630	51.87	5.07	80.75	21.667	40.98	55.828	37.64
20.4	60.522	52.92	4.79	83.21	21.547	42.29	55.597	39.99
30.3	60.397	53.92	4.47	85.24	21.410	43.49	55.331	41.90
May 10.3	60.264	54.83	4.12	86.80	21.262	44.52	55.042	43.35
20.3	60.127	55.59	3.75	87.86	21.111	45.36	54.735	44.31
	133	62	39	54	148	61	313	46
30.3	59.994	56.21	3.36	88.40	20.963	45.97	54.422	44.77
June 9.2	59.870	56.66	2.98	88.43	20.823	46.34	54.109	44.72
19.2	59.759	56.92	2.61	87.93	20.695	46.45	53.805	44.18
29.2	59.661	56.99	2.25	86.93	20.585	46.31	53.516	43.15
July 9.1	59.583	56.87	1.93	85.46	20.493	45.92	53.253	41.67
	60	32	29	189	70	64	230	187
19.1	59.523	56.55	1.64	83.57	20.423	45.28	53.023	39.80
29.1	59.486	56.04	1.41	81.30	20.376	44.42	52.834	37.56
Aug. 8.1	59.474	55.33	1.23	78.74	20.357	43.31	52.694	35.05
18.0	59.487	54.43	1.12	75.96	20.366	41.99	52.610	32.34
28.0	59.528	53.32	1.08	73.07	20.405	40.47	52.588	29.53
	73	129	6	292	72	173	47	281
Sept. 7.0	59.601	52.03	1.14	70.15	20.477	38.74	52.635	26.72
17.0	59.707	50.56	1.27	67.34	20.584	36.85	52.753	24.02
26.9	59.846	48.90	1.48	64.73	20.727	34.79	52.946	21.53
Oct. 6.9	60.022	47.08	1.79	62.45	20.910	32.62	53.213	19.37
16.9	60.235	45.13	2.17	60.57	21.131	30.35	53.551	17.62
	249	206	46	136	259	231	401	125
26.8	60.484	43.07	2.63	59.21	21.390	28.04	53.952	16.37
Nov. 5.8	60.765	40.93	3.16	58.41	21.684	25.72	54.409	15.69
15.8	61.076	38.78	3.73	58.24	22.009	23.46	54.909	15.64
25.8	61.408	36.69	4.33	58.72	22.358	21.32	55.434	16.21
Dec. 5.7	61.755	34.69	4.94	59.83	22.722	19.36	55.970	17.40
	350	183	59	173	369	170	530	179
15.7	62.105	32.86	5.53	61.56	23.091	17.66	56.500	19.19
25.7	62.449	31.27	6.09	63.85	23.453	16.25	57.005	21.52
35.7	62.775	29.94	6.61	66.64	23.797	15.19	57.470	24.33
Mean Place	57.642	65.12	1.621	54.56	18.555	52.41	52.556	11.48
Sec δ , Tan δ	1.091	+0.437	2.279	-2.047	1.168	+0.603	1.956	-1.681
$D\psi\alpha$, $D\omega\alpha$	+0.07	+0.03	+0.04	-0.13	+0.07	+0.04	+0.05	-0.11
$D\psi\delta$, $D\omega\delta$	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Argus. Mag. 2.8		ι Leonis. Mag. 5.3		δ^2 Chamseleon. Mag. 4.6		γ Hydr. Mag. 3.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 43	° ' -48 59	h m 10 44	° ' +10 58	h m 10 44	° ' -80 6	h m 10 45	° ' -15 45
	s 10 43	" -48 59	s 10 44	" +10 58	s 10 44	" -80 6	s 10 45	" -15 45
Jan. 0.7	16.248	7.10	58.704	34.05	65.66	16.89	36.356	53.69
10.6	16.615 ³⁶⁷	10.17 ³⁰⁷	59.002 ²⁹⁸	32.38 ¹⁶⁷	66.73 ¹⁰⁷	19.70 ²⁸¹	36.651 ²⁹⁵	56.22 ²⁵³
20.6	16.932 ³¹⁷	13.48 ³³¹	59.268 ²⁶⁶	30.94 ¹⁴⁴	67.64 ⁹¹	22.94 ³²⁴	36.912 ²⁶¹	58.75 ²⁵³
30.6	17.193 ²⁶¹	16.97 ³⁴⁹	59.493 ²²⁵	29.80 ¹¹⁴	68.35 ⁷¹	26.52 ³⁵⁸	37.131 ²¹⁹	61.20 ²⁴⁵
Feb. 9.6	17.391 ¹⁹⁴	20.53 ³⁵⁶	59.674 ¹⁸¹	28.92 ⁸⁸	68.86 ⁵¹	30.31 ³⁷⁹	37.305 ¹⁷⁴	63.51 ²⁶¹
	138 ³⁵³		132 ³⁵³	56 ⁵⁶	28 ²⁸	394 ³⁹⁴	126 ¹²⁶	212 ²¹²
19.5	17.525	24.06	59.806	28.36	69.14	34.25	37.431	65.63
Mar. 1.5	17.597 ⁷²	27.50 ³⁴⁴	59.891 ⁸⁵	28.07 ²⁹	69.23 ⁹	38.20 ³⁹⁵	37.511 ⁸⁰	67.54 ¹⁹¹
11.5	17.609 ¹²	30.76 ³²⁶	59.929 ³⁸	28.02 ⁵	69.10 ¹³	42.11 ³⁹¹	37.546 ³⁵	69.19 ¹⁶⁵
21.5	17.566 ⁴³	33.77 ³⁰¹	59.926 ³	28.20 ¹⁸	68.78 ³²	45.88 ³⁷⁷	37.541 ⁵	70.60 ¹⁴¹
31.4	17.475 ⁹¹	36.49 ²⁷²	59.886 ⁴⁰	28.55 ³⁵	68.28 ⁵⁰	49.42 ³⁵⁴	37.500 ⁴¹	71.72 ¹¹²
	130 ²³⁹		69 ⁶⁹	49 ⁴⁹	67 ⁶⁷	323 ³²³	70 ⁷⁰	86 ⁸⁶
Apr. 10.4	17.345	38.88	59.817	29.04	67.61	52.65	37.430	72.58
20.4	17.181 ¹⁶⁴	40.88 ²⁰⁰	59.726 ⁹¹	29.61 ⁵⁷	66.82 ⁷⁹	55.54 ²⁸⁹	37.340 ⁹⁰	73.18 ⁶⁰
30.3	16.993 ¹⁸⁸	42.49 ¹⁶¹	59.620 ¹⁰⁶	30.25 ⁶⁴	65.91 ⁹¹	58.00 ²⁴⁶	37.233 ¹⁰⁷	73.52 ³⁴
May 10.3	16.785 ²⁰⁸	43.64 ¹¹⁵	59.505 ¹¹⁵	30.91 ⁶⁶	64.90 ¹⁰¹	60.03 ²⁰³	37.116 ¹¹⁷	73.62 ¹⁰
20.3	16.568 ²¹⁷	44.35 ⁷¹	59.386 ¹¹⁹	31.56 ⁶⁵	63.82 ¹⁰⁸	61.53 ¹⁵⁰	36.995 ¹²¹	73.47 ¹⁵
	222 ²⁵		115 ¹¹⁵	62 ⁶²	112 ¹¹²	95 ⁹⁵	120 ¹²⁰	35 ³⁵
30.3	16.346	44.60	59.271	32.18	62.70	62.48	36.875	73.12
June 9.2	16.125 ²²¹	44.39 ²¹	59.160 ¹¹¹	32.75 ⁵⁷	61.55 ¹¹⁵	62.93 ⁴⁵	36.760 ¹¹⁵	72.55 ⁵⁷
19.2	15.913 ²¹²	43.73 ⁶⁶	59.059 ¹⁰¹	33.26 ⁵¹	60.44 ¹¹¹	62.78 ¹⁵	36.652 ¹⁰⁸	71.78 ⁷⁷
29.2	15.714 ¹⁹⁹	42.65 ¹⁰⁸	58.971 ⁸⁸	33.68 ⁴²	59.36 ¹⁰⁸	62.11 ⁶⁷	36.555 ⁹⁷	70.86 ⁹²
July 9.2	15.533 ¹⁸¹	41.17 ¹⁴⁸	58.898 ⁷³	34.02 ³⁴	58.35 ¹⁰¹	60.92 ¹¹⁹	36.472 ⁸³	69.79 ¹⁰⁷
	155 ¹⁸²		56 ⁵⁶	22 ²²	91 ⁹¹	109 ¹⁰⁹	68 ⁶⁸	117 ¹¹⁷
19.1	15.378	39.35	58.842	34.24	57.44	59.23	36.404	68.62
29.1	15.253 ¹²⁵	37.22 ²¹³	58.804 ³⁸	34.35 ¹¹	56.67 ⁷⁷	57.10 ²¹³	36.356 ⁴⁸	67.37 ¹²⁵
Aug. 8.1	15.164 ⁸⁹	34.88 ²³⁴	58.789 ¹⁵	34.32 ³	56.06 ⁶¹	54.59 ²⁵⁷	36.330 ²⁶	66.10 ¹²⁷
18.0	15.116 ⁴⁸	32.38 ²⁵⁰	58.797 ⁸	34.13 ¹⁹	55.63 ⁴³	51.82 ²⁷⁷	36.328 ²	64.85 ¹²⁵
28.0	15.115 ¹	29.82 ²⁵⁶	58.832 ³⁵	33.77 ³⁶	55.41 ²²	48.83 ²⁹⁹	36.355 ²⁷	63.67 ¹¹⁸
	51 ²⁵²		63 ⁶³	54 ⁵⁴	2 ²	309 ³⁰⁹	57 ⁵⁷	103 ¹⁰³
Sept. 7.0	15.166	27.30	58.895	33.23	55.39	45.74	36.412	62.64
17.0	15.270 ¹⁰⁴	24.91 ²³⁹	58.989 ⁹⁴	32.47 ⁷⁶	55.62 ²³	42.68 ³⁰⁶	36.503 ⁹¹	61.82 ⁸²
26.9	15.432 ¹⁶²	22.77 ²¹⁴	59.117 ¹²⁸	31.50 ⁹⁷	56.06 ⁴⁴	39.79 ²⁸⁹	36.631 ¹²⁸	61.25 ⁵⁷
Oct. 6.9	15.651 ²¹⁹	20.95 ¹⁸²	59.280 ¹⁶³	30.30 ¹²⁰	56.74 ⁶⁸	37.13 ²⁶⁶	36.796 ¹⁶⁵	60.98 ²⁷
16.9	15.926 ²⁷⁵	19.56 ¹³⁹	59.479 ¹⁹⁹	28.89 ¹⁴¹	57.61 ⁸⁷	34.88 ²²⁵	36.998 ²⁰²	61.07 ⁹
	326 ⁹¹		233 ²³³	162 ¹⁶²	105 ¹⁰⁵	184 ¹⁸⁴	239 ²³⁹	45 ⁴⁵
26.9	16.252	18.65	59.712	27.27	58.66	33.04	37.237	61.52
Nov. 5.8	16.623 ³⁷¹	18.30 ³⁵	59.978 ²⁶⁶	25.47 ¹⁸⁰	59.87 ¹²¹	31.79 ¹²⁵	37.510 ²⁷³	62.37 ⁸⁵
15.8	17.030 ⁴⁰⁷	18.53 ²³	60.273 ²⁹⁵	23.53 ¹⁹⁴	61.19 ¹³²	31.14 ⁶⁵	37.811 ³⁰¹	63.61 ¹²⁴
25.8	17.461 ⁴³¹	19.34 ⁸¹	60.588 ³¹⁵	21.50 ²⁰³	62.56 ¹³⁷	31.14 ⁰	38.132 ³²¹	65.20 ¹⁵⁹
Dec. 5.7	17.902 ⁴⁴¹	20.76 ¹⁴²	60.918 ³³⁰	19.44 ²⁰⁶	63.96 ¹⁴⁰	31.80 ⁶	38.466 ³²⁴	67.11 ¹⁹¹
	438 ¹⁹⁵		333 ³³³	204 ²⁰⁴	137 ¹³⁷	134 ¹³⁴	336 ³³⁶	217 ²¹⁷
15.7	18.340	22.71	61.251	17.40	65.33	33.14	38.802	69.28
25.7	18.761 ⁴²¹	25.13 ²⁴²	61.579 ³²⁸	15.46 ¹⁹⁴	66.61 ¹²⁸	35.09 ¹⁹⁵	39.130 ³²⁸	71.64 ²³⁶
35.7	19.150 ³⁴⁹	27.95 ²⁸²	61.889 ³¹⁰	13.68 ¹⁷⁸	67.78 ¹¹⁷	37.55 ²⁴⁶	39.438 ³⁰⁶	74.13 ²⁴⁹
Mean Place	14.332	12.95	56.942	45.65	61.608	27.63	34.649	50.45
Sec δ , Tan δ	1.524	-1.150	1.019	+0.194	5.823	-5.737	1.039	-0.282
$D\psi\alpha$, $D_\alpha\alpha$	+0.05	-0.07	+0.06	+0.01	+0.01	-0.36	+0.06	-0.02
$D\psi\delta$, $D_\alpha\delta$	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	46 Leonis Minoris. Mag. 3.9		54 Leonis. Mag. 4.5		Antlia. Mag. 4.7		Groombridge 1708. Mag. 6.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 48	° ' +34 38	h m 10 51	° ' +25 10	h m 10 52	° ' -36 41	h m 10 53	° ' +78 11
	s "	"	s "	"	s "	"	s "	"
Jan. 0.7	45.761	68.04 75	12.382	58.86 114	55.646	45.24 289	30.68 109	70.23 82
10.6	46.105 344	67.29 33	12.705 323	57.72 79	55.978 332	48.13 289	31.77 109	71.05 82
20.6	46.413 308	66.96 33	12.993 288	56.93 43	56.269 291	51.22 309	32.75 98	72.46 141
30.6	46.677 264	67.04 8	13.240 247	56.50 6	56.515 246	54.39 317	33.59 84	74.38 192
Feb. 9.6	46.890 213	67.50 46	13.440 200	56.44 28	56.709 194	57.56 317	34.23 64	76.74 236
	156	83	148		140	311	45	270
19.5	47.046 98	68.33 112	13.588 96	56.72 56	56.849 86	60.67 296	34.68 24	79.44 201
Mar. 1.5	47.144 43	69.45 133	13.684 46	57.28 82	56.935 36	63.63 278	34.92 3	82.35 301
11.5	47.187 9	70.78 149	13.730 1	58.10 99	56.971 11	66.41 252	34.95 18	85.36 298
21.5	47.178 53	72.27 155	13.729 42	59.09 111	56.960 50	68.93 223	34.77 37	86.34 283
31.4	47.125 91	73.82 154	13.687 75	60.20 117	56.910 86	71.16 192	34.40 54	91.17 257
Apr. 10.4	47.034 121	75.36 147	13.612 101	61.37 116	56.824 113	73.08 157	33.86 68	93.74 221
20.4	46.913 141	76.83 133	13.511 121	62.53 111	56.711 133	74.65 121	33.18 81	95.95 177
30.3	46.772 155	78.16 112	13.390 131	63.64 100	56.578 149	75.86 84	32.37 87	97.72 130
May 10.3	46.617 159	79.28 91	13.259 135	64.64 86	56.429 157	76.70 46	31.50 92	99.02 74
20.3	46.458 158	80.19 64	13.124 135	65.50 68	56.272 160	77.16 8	30.58 94	99.76 19
30.3	46.300 151	80.83 38	12.989 129	66.18 50	56.112 160	77.24 31	29.64 92	99.95 36
June 9.2	46.149 138	81.21 8	12.860 117	66.68 29	55.952 154	76.93 67	28.72 88	99.59 90
19.2	46.011 122	81.29 21	12.743 106	66.97 9	55.798 144	76.26 101	27.84 81	98.69 144
29.2	45.889 105	81.08 48	12.637 90	67.06 14	55.654 130	75.25 133	27.03 71	97.25 190
July 9.2	45.784 81	80.60 78	12.548 60	66.92 34	55.524 110	73.92 161	26.32 62	95.35 233
19.1	45.703 57	79.82 102	12.479 49	66.58 56	55.414 90	72.31 182	25.70 51	93.02 272
29.1	45.646 30	78.80 128	12.430 25	66.02 78	55.324 62	70.49 199	25.19 37	90.30 306
Aug. 8.1	45.616 3	77.52 151	12.405 1	65.24 98	55.262 31	68.50 210	24.82 22	87.25 330
18.0	45.613 31	76.01 173	12.404 29	64.26 119	55.231 4	66.40 210	24.60 9	83.95 349
28.0	45.644 64	74.28 192	12.433 60	63.07 139	55.235 43	64.30 205	24.51 7	80.46 362
Sept. 7.0	45.708 100	72.36 211	12.493 91	61.68 159	55.278 86	62.25 190	24.58 21	76.84 368
17.0	45.808 138	70.25 224	12.584 128	60.09 177	55.364 132	60.35 165	24.79 37	73.16 364
26.9	45.946 179	68.01 236	12.712 165	58.32 192	55.496 181	58.70 133	25.16 52	69.52 353
Oct. 6.9	46.125 220	65.65 244	12.877 203	56.40 207	55.677 226	57.37 95	25.68 67	65.99 338
16.9	46.345 259	63.21 247	13.080 241	54.33 217	55.903 270	56.42 49	26.35 80	62.61 312
26.9	46.604 297	60.74 244	13.321 275	52.16 223	56.173 310	55.93 3	27.15 93	59.49 278
Nov. 5.8	46.901 329	58.30 236	13.596 306	49.93 224	56.483 344	55.96 53	28.08 104	56.71 238
15.8	47.230 355	55.94 221	13.902 331	47.69 218	56.827 366	56.49 105	29.12 114	54.33 189
25.8	47.585 373	53.73 199	14.233 364	45.51 205	57.193 380	57.54 201	30.26 118	52.44 186
Dec. 5.7	47.958 380	51.74 170	14.582 349	43.46 188	57.573 383	59.09 239	31.44 120	51.08 76
15.7	48.338 375	50.04 138	14.936 348	41.58 163	57.956 371	61.10 273	32.64 119	50.32 16
25.7	48.713 358	48.66 99	15.284 334	39.95 133	58.327 348	63.49 273	33.83 114	50.16 47
35.7	49.071 358	47.67 99	15.618 334	38.62 133	58.675 348	66.22 273	34.97 114	50.63 47
Mean Place	43.836	86.34	10.571	74.75	53.904	48.21	26.129	95.30
Sec δ , Tan δ	1.216	+0.691	1.105	+0.470	1.247	-0.745	4.893	+4.790
$D\phi\alpha$, $D\omega\alpha$	+0.07	+0.04	+0.07	+0.03	+0.06	-0.06	+0.10	+0.31
$D\phi\delta$, $D\omega\delta$	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Crateris. Mag. 4.2		δ Leonis. Mag. 5.0		β Ursæ Majoris. Mag. 2.4		α Ursæ Majoris. Mag. 2.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 55	° ' -17 51	h m 10 56	° ' + 4 2	h m 10 56	° ' +56 48	h m 10 58	° ' +62 10
	s 10 55	"	s 10 56	"	s 10 56	"	s 10 58	"
Jan. 0.7	48.317	45.96	21.252	79.20	56.541	56.98	43.36	74.35
10.7	48.619 ³⁰²	48.54 ²⁵⁸	21.551 ²⁹⁹	77.25 ¹⁹⁵	57.017 ⁴⁷⁶	57.03 ⁵	43.90 ⁵⁴	74.58 ²³
20.6	48.887 ²⁶⁸	51.10 ²⁵⁶	21.819 ²⁶⁸	75.48 ¹⁷⁷	57.446 ⁴²⁹	57.62 ⁵⁹	44.39 ⁴⁹	75.36 ⁷⁸
30.6	49.116 ²²⁹	53.63 ²⁵³	22.051 ²³²	73.95 ¹⁵³	57.814 ³⁶⁸	58.73 ¹¹¹	44.82 ⁴³	76.68 ¹²³
Feb. 9.6	49.300 ¹⁸⁴	56.04 ²⁴¹	22.239 ¹⁸⁸	72.67 ¹²⁸	58.112 ²⁹⁸	60.28 ¹⁵⁵	45.15 ³³	78.45 ¹⁷⁷
	138	224	141	101	217	193	24	215
19.5	49.438 ⁸⁹	58.28	22.380 ⁹⁴	71.66 ⁷³	58.329 ¹³⁴	62.21	45.39 ¹⁶	80.60 ²⁴¹
Mar. 1.5	49.527 ⁴⁴	60.30 ²⁰²	22.474 ⁴⁹	70.93 ⁴⁹	58.463 ⁵¹	64.43 ²²²	45.55 ⁵	83.01 ²⁶⁰
11.5	49.571 ³	62.10 ¹⁸⁰	22.523 ⁸	70.44 ²³	58.514 ²⁶	66.83 ²⁴⁶	45.60 ⁴	85.61 ²⁶⁴
21.5	49.574 ³³	63.63 ¹²⁶	22.531 ²⁷	70.21 ²	58.488 ⁹⁸	69.29 ²⁴³	45.56 ¹²	88.25 ²⁵⁸
31.4	49.541 ⁶²	64.89 ¹⁰⁰	22.504 ⁵⁶	70.19 ¹⁵	58.390 ¹⁵⁸	71.72 ²³⁰	45.44 ²⁰	90.83 ²⁴²
Apr. 10.4	49.479 ⁸⁵	65.89 ⁷²	22.448 ⁸⁰	70.34 ³⁰	58.232 ²⁰⁸	74.02 ²⁰⁷	45.24 ²⁵	93.25 ²¹⁶
20.4	49.394 ¹⁰²	66.61 ⁴⁶	22.368 ⁹⁶	70.64 ⁴¹	58.024 ²⁴⁶	76.09 ¹⁷⁶	44.99 ³¹	95.41 ¹⁵³
30.4	49.292 ¹¹⁵	67.07 ²⁰	22.272 ¹⁰⁶	71.05 ⁵⁰	57.778 ²⁷⁰	77.85 ¹⁴²	44.68 ³²	97.24 ¹⁴³
May 10.3	49.177 ¹²⁰	67.27 ⁴	22.166 ¹¹²	71.55 ⁵⁵	57.508 ²⁸⁴	79.27 ¹⁰⁰	44.36 ³⁵	98.67 ⁹⁸
20.3	49.057 ¹²¹	67.23 ²⁹	22.054 ¹¹¹	72.10 ⁵⁹	57.224 ²⁸⁶	80.27 ⁵⁶	44.01 ³⁶	99.65 ⁵²
30.3	48.936 ¹¹⁷	66.94 ⁵¹	21.943 ¹⁰⁷	72.69 ⁶¹	56.938 ²⁸⁰	80.83 ¹¹	43.65 ³⁴	100.17 ⁴
June 9.2	48.819 ¹¹³	66.43 ⁷²	21.836 ¹⁰¹	73.30 ⁶¹	56.658 ²⁶³	80.94 ³⁴	43.31 ³³	100.21 ⁴⁶
19.2	48.706 ¹⁰⁴	65.71 ⁹¹	21.735 ⁹⁰	73.91 ⁵⁹	56.395 ²⁴¹	80.60 ⁷⁸	42.98 ³¹	99.75 ⁹¹
29.2	48.602 ⁹¹	64.80 ¹⁰⁷	21.645 ⁷⁸	74.50 ⁵⁵	56.154 ²¹¹	79.82 ¹¹⁹	42.67 ²⁷	98.84 ¹³⁶
July 9.2	48.511 ⁷⁶	63.73 ¹²⁰	21.567 ⁶²	75.05 ⁵⁰	55.943 ¹⁷⁶	78.63 ¹⁶⁰	42.40 ²¹	97.48 ¹⁷⁸
19.1	48.435 ⁵⁹	62.53 ¹²⁸	21.505 ⁴⁵	75.55 ⁴²	55.767 ¹³⁸	77.03 ¹⁹⁵	42.19 ¹⁸	95.70 ²¹⁵
29.1	48.376 ³⁸	61.25 ¹³³	21.460 ²⁵	75.97 ³²	55.629 ⁹⁵	75.08 ²²⁶	42.01 ¹²	93.55 ²⁴⁹
Aug. 8.1	48.338 ¹³	59.92 ¹³³	21.435 ³	76.29 ¹⁹	55.534 ⁴⁹	72.82 ²⁵⁶	41.89 ⁹	91.06 ²⁷⁵
18.1	48.325 ¹⁵	58.59 ¹²⁵	21.432 ²³	76.48 ⁴	55.485 ²	70.26 ²⁷⁸	41.80 ¹	88.31 ³⁰⁰
28.0	48.340 ⁴⁵	57.34 ¹¹²	21.455 ⁵⁰	76.52 ¹⁵	55.487 ⁵⁴	67.48 ²⁹⁶	41.79 ⁴	85.31 ³¹⁷
Sept. 7.0	48.385 ⁸⁰	56.22 ⁹⁵	21.505 ⁸²	76.37 ³⁴	55.541 ¹⁰⁹	64.52 ³¹¹	41.83 ¹²	82.14 ³²⁸
17.0	48.465 ¹¹⁷	55.27 ⁶⁹	21.587 ¹¹⁵	76.03 ⁵⁷	55.650 ¹⁶⁶	61.41 ³¹⁷	41.95 ¹⁸	78.86 ³³⁵
26.9	48.582 ¹⁵⁶	54.58 ⁴⁰	21.702 ¹⁵¹	75.46 ⁸³	55.816 ²²⁴	58.24 ³¹⁸	42.13 ²⁵	75.51 ³³³
Oct. 6.9	48.738 ¹⁹⁵	54.18 ⁴	21.853 ¹⁸⁶	74.63 ¹⁰⁹	56.040 ²⁸⁴	55.06 ³¹⁴	42.38 ³¹	72.18 ³²⁶
16.9	48.933 ²³³	54.14 ³⁴	22.039 ²²³	73.54 ¹³⁴	56.324 ³⁴⁰	51.92 ³⁰¹	42.69 ³⁹	68.92 ³⁰⁹
26.9	49.166 ²⁶⁶	54.48 ⁷³	22.262 ²⁵⁷	72.20 ¹⁵⁸	56.664 ³⁶³	48.91 ²⁸²	43.08 ⁴⁴	65.83 ²⁸⁸
Nov. 5.8	49.432 ³⁰⁰	55.21 ¹¹³	22.519 ²⁸⁶	70.62 ¹⁷⁸	57.057 ⁴⁴¹	46.09 ²⁵⁵	43.52 ⁵⁰	62.95 ²⁵⁶
15.8	49.732 ³²¹	56.34 ¹⁵⁰	22.805 ³²³	68.84 ¹⁹⁵	57.498 ⁴⁷⁹	43.54 ²²¹	44.02 ⁵⁴	60.39 ²¹⁹
25.8	50.053 ³³⁵	57.84 ²¹³	23.115 ³³⁰	66.89 ²⁰⁷	57.977 ⁵⁰⁴	41.33 ¹⁸⁰	44.56 ⁵⁷	58.20 ¹⁷³
Dec. 5.8	50.388 ³³⁹	59.68 ²³⁴	23.438 ³³⁰	64.82 ²¹¹	58.481 ⁵¹⁸	39.53 ¹³³	45.13 ⁵⁹	56.47 ¹²³
15.7	50.727 ³³²	61.81 ²⁵⁰	23.768 ³²⁷	62.71 ²¹⁰	58.999 ⁵¹⁴	38.20 ⁸¹	45.72 ⁵⁸	55.24 ⁶⁹
25.7	51.059 ³¹⁶	64.15	24.095 ³¹¹	60.61 ²⁰¹	59.513 ⁴⁹³	37.39 ²⁷	46.30 ⁵⁶	54.55 ¹¹
35.7	51.375	66.65	24.406	58.60	60.006	37.12	46.86	54.44
Mean Place	46.657	43.41	19.579	88.79	54.234	80.09	40.859	98.30
Sec δ , Tan δ	1.051	-0.322	1.003	+0.071	1.827	+1.529	2.144	+1.896
$D\alpha, D\delta$	+0.06	-0.02	+0.06	0.00	+0.07	+0.10	+0.07	+0.12
$D\alpha\delta, D\delta\delta$	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Leonis. Mag. 4.7		p^4 Leonis. Mag. 5.7		ψ Ursae Majoris. Mag. 3.2		β Crateris. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 0	° ' " + 7 46	h m 11 2	° ' " + 2 23	h m 11 5	° ' " +44 55	h m 11 7	° ' " -22 22
	s	"	s	"	s	"	s	"
Jan. 0.7	48.960	36.13	44.941	54.65	5.553	76.10	38.981	42.09
10.7	49.262 ³⁰²	34.30 ¹⁸³	45.242 ³⁰¹	52.64 ²⁰¹	5.946 ³⁹³	75.61 ⁴⁹	39.295 ³¹⁴	44.71 ²⁶²
20.6	49.535 ²⁷³	32.68 ¹⁶²	45.513 ²⁷¹	50.79 ¹⁸⁵	6.304 ³⁵⁸	75.63 ²	39.579 ²⁸⁴	47.39 ²⁶⁸
30.6	49.772 ²³⁷	31.31 ¹³⁷	45.748 ²³⁵	49.16 ¹⁶³	6.615 ³¹¹	76.12 ⁴⁹	39.821 ²⁴²	50.07 ²⁶⁸
Feb. 9.6	49.964 ¹⁹²	30.24 ¹⁰⁷	45.940 ¹⁹²	47.77 ¹³⁹	6.869 ²⁵⁴	77.06 ⁹⁴	40.020 ¹⁹⁹	52.66 ²⁵⁹
	145	79	146	111	191	133	151	247
19.5	50.109	29.45	46.086	46.66	7.060	78.39	40.171	55.13
Mar. 1.5	50.208 ⁹⁹	28.94 ⁵¹	46.185 ⁹⁹	45.81 ⁸⁵	7.188 ¹²⁸	80.03 ¹⁶⁴	40.274 ¹⁰³	57.41 ²²⁸
11.5	50.261 ⁵³	28.69 ²⁵	46.240 ⁵⁵	45.23 ³⁸	7.251 ⁶³	81.91 ¹⁸⁸	40.331 ⁵⁷	59.46 ²⁰⁵
21.5	50.274 ¹³	28.68 ¹	46.254 ¹⁴	44.88 ⁵⁵	7.253 ²	83.92 ²⁰¹	40.347 ¹⁶	61.27 ¹⁸¹
31.4	50.249 ²⁵	28.88 ²⁰	46.232 ²²	44.77 ¹¹	7.200 ⁵³	85.97 ²⁰⁵	40.325 ²²	62.80 ¹⁵³
	54	34	51	7	99	201	51	126
Apr. 10.4	50.195	29.22	46.181	44.84	7.101	87.98	40.274	64.06
20.4	50.116 ⁷⁹	29.69 ⁴⁷	46.106 ⁷⁵	45.07 ²³	6.965 ¹³⁶	89.86 ¹⁸⁸	40.196 ⁷⁸	65.05 ⁹⁹
30.4	50.021 ⁹⁵	30.25 ⁵⁶	46.014 ⁹²	45.43 ³⁶	6.799 ¹⁶⁶	91.52 ¹⁶⁶	40.100 ⁹⁶	65.74 ⁶⁹
May 10.3	49.915 ¹⁰⁶	30.86 ⁶¹	45.911 ¹⁰⁸	45.88 ⁴⁵	6.614 ¹⁸⁵	92.93 ¹⁴¹	39.990 ¹¹⁰	66.16 ⁴²
20.3	49.804 ¹¹¹	31.50 ⁶⁴	45.802 ¹⁰⁹	46.40 ⁵²	6.419 ¹⁹⁵	94.02 ¹⁰⁹	39.870 ¹²⁰	66.28 ¹²
	113	68	110	58	199	74	122	14
30.3	49.691	32.13	45.692	46.98	6.220	94.76	39.748	66.14
June 9.2	49.582 ¹⁰⁹	32.74 ⁶¹	45.584 ¹⁰⁸	47.59 ⁶¹	6.026 ¹⁹⁴	95.15 ³⁹	39.625 ¹²³	65.74 ⁴⁰
19.2	49.479 ¹⁰³	33.32 ⁵⁸	45.482 ¹⁰²	48.21 ⁶²	5.842 ¹⁸⁴	95.16 ¹	39.506 ¹¹⁹	65.09 ⁶⁵
29.2	49.386 ⁹³	33.84 ⁵²	45.389 ⁹³	48.83 ⁶²	5.675 ¹⁶⁷	94.80 ³⁶	39.395 ¹¹¹	64.21 ⁸⁸
July 9.2	49.305 ⁸¹	34.29 ⁴⁵	45.308 ⁸¹	49.43 ⁶⁰	5.526 ¹⁴⁹	94.07 ⁷³	39.293 ¹⁰²	63.14 ¹⁰⁷
	65	36	66	55	125	108	88	126
19.1	49.240	34.65	45.242	49.98	5.401	92.99	39.205	61.88
29.1	49.190 ⁵⁰	34.90 ²⁵	45.191 ⁵¹	50.46 ⁴⁸	5.303 ⁹⁸	91.59 ¹⁴⁰	39.133 ⁷²	60.51 ¹³⁷
Aug. 8.1	49.161 ²⁹	35.04 ¹⁴	45.160 ³¹	50.86 ⁴⁰	5.236 ⁶⁷	89.88 ¹⁷¹	39.082 ⁵¹	59.06 ¹⁴⁵
18.1	49.153 ⁸	35.03 ¹	45.150 ¹⁰	51.12 ²⁶	5.201 ³⁵	87.88 ²⁰⁰	39.055 ²⁷	57.58 ¹⁴⁸
28.0	49.171 ¹⁸	34.84 ¹⁹	45.166 ¹⁶	51.26 ¹⁴	5.203 ²	85.66 ²²²	39.056 ¹	56.13 ¹⁴⁵
	46	36	43	4	41	244	33	135
Sept. 7.0	49.217	34.48	45.209	51.22	5.244	83.22	39.089	54.78
17.0	49.294 ⁷⁷	33.91 ⁵⁷	45.283 ⁷⁴	50.96 ²⁶	5.327 ⁸²	80.59 ²⁶³	39.158 ⁶⁹	53.60 ¹¹⁸
26.9	49.405 ¹¹¹	33.10 ⁸¹	45.391 ¹⁰⁸	50.48 ⁴⁸	5.455 ¹²⁸	77.85 ²⁷⁴	39.267 ¹⁰⁹	52.65 ⁹⁵
Oct. 6.9	49.551 ¹⁴⁶	32.07 ¹⁰³	45.585 ¹⁴⁴	49.74 ⁷⁴	5.630 ¹⁷⁵	75.01 ²⁸⁴	39.414 ¹⁴⁷	51.99 ⁶⁶
16.9	49.734 ¹⁸³	30.79 ¹²⁸	45.716 ¹⁸¹	48.74 ¹⁰⁰	5.852 ²²²	72.14 ²⁸⁷	39.604 ¹⁹⁰	51.69 ³⁰
	220	150	217	127	270	284	230	8
26.9	49.954	29.29	45.933	47.47	6.122	69.30	39.834	51.77
Nov. 5.8	50.208 ²⁵⁴	27.58 ¹⁷¹	46.185 ²⁵²	45.96 ¹⁵¹	6.436 ³¹⁴	66.55 ²⁷⁵	40.103 ²⁶⁹	52.26 ⁴⁹
15.8	50.492 ²⁸⁴	25.69 ¹⁸⁹	46.467 ²⁸²	44.21 ¹⁷⁵	6.790 ³⁵⁴	63.98 ²⁵⁷	40.404 ³⁰¹	53.18 ⁹²
25.8	50.801 ³⁰⁹	23.67 ²⁰²	46.774 ³⁰⁷	42.28 ¹⁹³	7.177 ³⁸⁷	61.62 ²³⁶	40.729 ³²⁵	54.52 ¹³⁴
Dec. 5.8	51.125 ³²⁴	21.58 ²⁰⁹	47.096 ³²²	40.22 ²⁰⁶	7.587 ⁴¹⁰	59.59 ²⁰³	41.071 ³⁴²	56.23 ¹⁷¹
	332	210	329	214	423	167	348	205
15.7	51.457	19.48	47.425	38.08	8.010	57.92	41.419	58.28
25.7	51.785 ³²⁸	17.43 ²⁰⁵	47.751 ³²⁶	35.96 ²¹²	8.431 ⁴²¹	56.68 ¹²⁴	41.762 ³⁴³	60.59 ²³¹
35.7	52.098 ³¹³	15.51 ¹⁹²	48.063 ³¹²	33.90 ²⁰⁶	8.837 ⁴⁰⁶	55.92 ⁷⁶	42.089 ³²⁷	63.09 ²⁵⁰
Mean Place	47.301	46.96	43.307	63.76	3.622	97.30	37.373	41.03
Sec δ , Tan δ	1.009	+0.137	1.001	+0.042	1.412	+0.998	1.081	-0.412
$D\phi\alpha$, $D\omega\alpha$	+0.06	+0.01	+0.06	0.00	+0.07	+0.06	+0.06	-0.03
$D\phi\delta$, $D\omega\delta$	-0.4	+0.3	-0.4	+0.2	-0.4	+0.2	-0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Leonis. Mag. 2.6		θ Leonis. Mag. 3.4		γ Ursae Majoris. Mag. 3.7		δ Crateris. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 9	° ' " +20 57	h m 11 9	° ' " +15 52	h m 11 14	° ' " +33 31	h m 11 15	° ' " -14 20
	s 11 9	" +20 57	s 11 9	" +15 52	s 11 14	" +33 31	s 11 15	" -14 20
Jan. 0.7	46.678	68.24	57.944	27.15	4.960	72.41	15.930	8.28
10.7	47.002 ³²⁴	66.82 ¹⁴²	58.259 ³¹⁵	25.56 ¹⁵⁹	5.312 ³⁵²	71.42 ⁹⁹	16.240 ³¹⁰	10.71 ²⁴³
20.6	47.296 ²⁹⁴	65.74 ¹⁰⁸	58.546 ²⁸⁷	24.25 ¹³¹	5.634 ³²²	70.86 ⁵⁶	16.523 ²⁸³	13.13 ²⁴²
30.6	47.551 ²⁵⁵	65.01 ⁷³	58.796 ²⁵⁰	23.27 ⁹⁸	5.918 ²⁸⁴	70.74 ¹²	16.767 ²⁴⁴	15.49 ²²⁶
Feb. 9.6	47.763 ²¹²	64.64 ³⁷	59.002 ²⁰⁶	22.62 ⁶⁵	6.151 ²³³	71.04 ³⁰	16.969 ²⁰²	17.72 ²²²
	163	3	159	32	181	69	156	208
19.6	47.926	64.61	59.161	22.30	6.332	71.73	17.125	19.75
Mar. 1.5	48.040 ¹¹⁴	64.90 ²⁹	59.272 ¹¹¹	22.27 ³	6.458 ¹²⁶	72.74 ¹⁰¹	17.236 ¹¹¹	21.59 ¹⁸⁴
	65	55	64	25	73	129	67	159
11.5	48.105 ²⁰	65.45 ⁷⁸	59.336 ²¹	22.52 ⁴⁸	6.530 ²¹	74.03 ¹⁴⁷	17.303 ²⁶	23.18 ¹³⁴
21.5	48.125 ²⁰	66.23 ⁹³	59.357 ¹⁷	23.00 ⁶⁶	6.551 ²⁵	75.50 ¹⁵⁹	17.329 ¹¹	24.52 ¹⁰⁹
31.4	48.105 ⁵³	67.16 ¹⁰⁸	59.340 ⁵⁰	23.66 ⁷⁷	6.526 ⁶⁵	77.09 ¹⁶²	17.318 ⁴⁰	25.61 ⁸⁴
Apr. 10.4	48.052	68.19	59.290	24.43	6.461	78.71	17.278	26.45
	81	107	76	86	97	158	67	58
20.4	47.971 ¹⁰⁰	69.26 ¹⁰⁵	59.214 ⁹⁵	25.29 ⁸⁸	6.364 ¹²¹	80.29 ¹⁴⁷	17.211 ⁸⁴	27.03 ³⁶
30.4	47.871 ¹¹⁵	70.31 ¹⁰⁰	59.119 ¹⁰⁷	26.17 ⁸⁶	6.243 ¹³⁸	81.76 ¹³¹	17.127 ⁹⁷	27.39 ¹²
May 10.3	47.756 ¹²³	71.31 ⁷⁶	59.012 ¹¹⁷	27.03 ⁷³	6.105 ¹⁵¹	83.07 ⁸⁵	17.030 ¹¹¹	27.51 ³⁰
	123	91	115	82	148	109	107	8
20.3	47.634 ¹²³	72.22 ⁷⁶	58.897 ¹¹⁷	27.85 ⁷³	5.957 ¹⁵¹	84.16 ⁸⁵	16.923 ¹¹¹	27.43 ³⁰
30.3	47.511	72.98	58.780	28.58	5.806	85.01	16.812	27.13
June 9.3	47.389 ¹²²	73.60 ⁶²	58.665 ¹¹⁵	29.21 ⁶³	5.657 ¹⁴⁹	85.60 ⁵⁹	16.700 ¹¹²	26.66 ⁴⁷
	114	46	110	52	143	29	108	66
19.2	47.275 ¹⁰⁶	74.06 ²⁶	58.555 ¹⁰⁰	29.73 ³⁸	5.514 ¹³²	85.89 ²	16.592 ¹⁰³	26.00 ⁸⁰
29.2	47.169 ⁹³	74.32 ⁸	58.455 ⁹⁰	30.11 ²³	5.382 ¹¹⁷	85.91 ³⁰	16.489 ⁹⁴	25.20 ⁹³
July 9.2	47.076 ⁷⁷	74.40 ¹¹	58.366 ⁷⁴	30.34 ⁷	5.265 ¹⁰¹	85.61 ⁵⁸	16.395 ⁸³	24.27 ¹⁰³
19.1	46.999 ⁶¹	74.29 ³³	58.292 ⁵⁷	30.41 ⁹	5.164 ⁷⁹	85.03 ⁸⁵	16.312 ⁶⁷	23.24 ¹¹¹
29.1	46.938 ⁴¹	73.96 ⁵²	58.235 ³⁹	30.32 ²⁷	5.085 ⁵⁷	84.18 ¹¹³	16.245 ⁴⁹	22.13 ¹¹²
Aug. 8.1	46.897 ¹⁶	73.44 ⁷⁴	58.196 ¹⁵	30.05 ⁴⁵	5.028 ³⁰	83.05 ¹³⁹	16.196 ²⁶	21.01 ¹¹²
	18.1	72.70 ⁹⁴	58.181 ⁸	29.60 ⁶⁵	4.998 ¹	81.66 ¹⁶³	16.170 ³	19.89 ¹⁰⁴
28.0	46.891 ³⁷	71.76 ¹¹⁶	58.189 ³⁸	28.95 ⁸⁵	4.997 ³¹	80.03 ¹⁸⁶	16.167 ²⁸	18.85 ⁹²
Sept. 7.0	46.928	70.60	58.227	28.10	5.028	78.17	16.195	17.93
	71	69.24 ¹³⁶	58.296 ⁶⁹	27.03 ¹⁰⁷	5.096 ⁶⁸	76.11 ²⁰⁶	16.257 ⁶²	17.19 ⁷⁴
17.0	46.999 ¹⁰⁵	67.67 ¹⁵⁷	58.400 ¹⁰⁴	25.75 ¹²⁸	5.201 ¹⁰⁵	73.88 ²²³	16.353 ⁹⁶	16.67 ⁵²
Oct. 6.9	47.246 ¹⁴²	65.91 ¹⁷⁶	58.539 ¹³⁹	24.27 ¹⁴⁸	5.348 ¹⁴⁷	71.49 ²³⁹	16.490 ¹³⁷	16.44 ²³
	182	63.98 ¹⁹³	58.717 ¹⁷⁸	22.57 ¹⁷⁰	5.536 ¹⁸⁸	69.00 ²⁴⁹	16.666 ¹⁷⁶	16.53 ⁹
16.9	47.428 ²²⁰	61.89 ²⁰⁹	58.933 ²¹⁶	20.71 ¹⁸⁶	5.768 ²³²	66.45 ²⁵⁵	16.882 ²¹⁶	16.97 ⁴⁴
26.9	47.648	59.71 ²¹⁸	59.185 ²⁵²	18.69 ²⁰²	5.040 ²⁷²	63.89 ²⁵⁶	17.135 ²⁵³	17.77 ⁸⁰
Nov. 5.8	47.905 ²⁵⁷	57.47 ²²⁴	59.468 ²⁸³	16.57 ²¹²	6.349 ³⁰⁹	61.38 ²⁵¹	17.420 ²⁸⁵	18.94 ¹¹⁷
	15.8	55.23 ²²⁴	59.780 ³¹²	14.40 ²¹⁷	6.688 ³³⁹	58.99 ²³⁹	17.732 ³¹²	20.46 ¹⁵³
25.8	48.512 ³³⁶	53.05 ²¹⁸	60.109 ³²⁹	12.24 ²¹⁶	7.050 ³⁶²	56.81 ²¹⁸	18.061 ³²⁹	22.26 ¹⁸⁰
Dec. 5.8	48.848 ³⁴⁶	51.02 ²⁰³	60.447 ³³⁸	10.17 ²⁰⁷	7.423 ³⁷³	54.87 ¹⁹⁴	18.398 ³³⁷	24.34 ²⁰⁸
	15.7	49.17 ¹⁸⁵	60.785 ³³⁸	8.23 ¹⁹⁴	7.798 ³⁷⁵	53.28 ¹⁵⁹	18.733 ³³⁵	26.59 ²²⁵
25.7	49.540 ³³³	47.59 ¹⁵⁸	61.110 ³²⁵	6.51 ¹⁷²	8.161 ³⁶³	52.05 ¹²³	19.054 ³²¹	28.95 ²³⁶
35.7	49.873							
Mean Place	45.019	83.30	56.310	40.66	3.245	91.12	14.373	4.66
Sec δ , Tan δ	1.071	+0.383	1.039	+0.284	1.200	+0.663	1.032	-0.256
$D\psi\alpha$, $D_w\alpha$	+0.06	+0.02	+0.06	+0.02	+0.06	+0.04	+0.06	-0.02
$D\psi\delta$, $D_w\delta$	-0.4	+0.2	-0.4	+0.2	-0.4	+0.2	-0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ Leonis. Mag. 4.1		π Centauri. Mag. 4.3		ι Leonis. Mag. 4.0		τ Leonis. Mag. 5.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 16	° ' " + 6 28	h m 11 17	° ' " -54 2	h m 11 19	° ' " +10 58	h m 11 23	° ' " + 3 17
	s 11 16	" + 6 28	s 11 17	" -54 2	s 11 19	" +10 58	s 11 23	" + 3 17
Jan. 0.7	56.117	33.82	17.509	21.66	40.577	39.79	44.759	79.30
10.7	56.427 310	31.91 191	17.943 434	24.42 276	40.891 314	38.00 179	45.070 311	77.29 201
20.6	56.710 283	30.21 170	18.330 387	27.52 310	41.180 289	36.47 153	45.356 286	75.45 184
30.6	56.957 247	28.74 147	18.661 331	30.87 335	41.432 252	35.22 125	45.607 251	73.84 161
Feb. 9.6	57.163 206	27.57 117	18.930 269	34.38 351	41.644 212	34.26 96	45.818 211	72.48 136
	161	90	202	358	166	63	167	109
19.6	57.324	26.67 60	19.132 134	37.96 356	41.810 119	33.63 3	45.985 121	71.39 80
Mar. 1.5	57.439 115	26.07 33	19.266 70	41.52 345	41.929 75	33.30 7	46.106 77	70.59 54
11.5	57.510 71	25.74 9	19.336 9	44.97 329	42.004 32	33.23 19	46.183 36	70.05 27
21.5	57.538 28	25.65 13	19.345 49	48.26 304	42.036 5	33.42 39	46.219 0	69.78 6
31.4	57.531 7	25.78 30	19.296 95	51.90 277	42.031 39	33.81 54	46.219 32	69.72 13
Apr. 10.4	57.491	26.08 44	19.201 139	54.07 241	41.992 64	34.35 66	46.187 57	69.85 30
20.4	57.426 65	26.52 54	19.062 175	56.48 204	41.928 84	35.01 73	46.130 78	70.15 42
30.4	57.343 83	27.06 60	18.887 208	58.52 163	41.844 97	35.74 76	46.052 91	70.57 51
May 10.3	57.247 96	27.66 64	18.684 223	60.15 118	41.747 106	36.50 75	45.961 99	71.08 57
20.3	57.143 104	28.30 66	18.461 238	61.33 72	41.641 110	37.25 71	45.862 105	71.65 61
30.3	57.035 107	28.96 64	18.223 247	62.05 25	41.531 110	37.96 66	45.757 105	72.26 64
June 9.3	56.928 103	29.60 61	17.976 248	62.30 22	41.421 105	38.62 59	45.652 103	72.90 63
19.2	56.825 97	30.21 56	17.728 241	62.08 68	41.316 99	39.21 49	45.549 97	73.53 62
29.2	56.728 87	30.77 50	17.484 234	61.40 113	41.217 89	39.70 39	45.452 89	74.15 58
July 9.2	56.641 73	31.27 42	17.253 211	60.27 153	41.128 76	40.09 26	45.363 77	74.73 52
19.1	56.568 62	31.69 32	17.042 186	58.74 189	41.052 63	40.35 13	45.286 63	75.25 44
29.1	56.506 42	32.01 19	16.856 151	56.85 220	40.989 43	40.48 1	45.223 48	75.69 35
Aug. 8.1	56.464 20	32.20 6	16.705 109	54.65 243	40.946 24	40.47 19	45.175 26	76.04 21
18.1	56.444 2	32.26 10	16.596 60	52.22 257	40.922 0	40.28 26	45.149 4	76.25 7
28.0	56.446 30	32.16 30	16.536 3	49.65 263	40.922 26	39.92 56	45.145 23	76.32 10
Sept. 7.0	56.476	31.86 50	16.533 56	47.02 257	40.950 59	39.36 78	45.168 53	76.22 32
17.0	56.537 61	31.36 73	16.589 122	44.45 243	41.009 92	38.58 100	45.221 88	75.90 53
27.0	56.631 94	30.63 97	16.711 190	42.02 217	41.101 129	37.58 123	45.309 125	75.37 79
Oct. 6.9	56.762 131	29.66 122	16.901 256	39.85 182	41.230 168	36.35 145	45.434 163	74.58 106
16.9	56.932 207	28.44 145	17.157 319	38.03 137	41.398 206	34.90 167	45.597 201	73.53 130
26.9	57.139	26.99 168	17.476 377	36.66 87	41.604 242	33.23 185	45.798 237	72.23 156
Nov. 5.8	57.382 243	25.31 187	17.853 424	35.79 30	41.846 275	31.38 201	46.035 272	70.67 177
15.8	57.657 275	23.44 201	18.277 461	35.49 29	42.121 304	29.37 215	46.307 300	68.90 194
25.8	57.960 308	21.43 212	18.738 482	35.78 90	42.425 323	27.25 212	46.607 319	66.96 208
Dec. 5.8	58.281 321	19.31 213	19.220 488	36.68 147	42.748 333	25.10 213	46.926 329	64.88 214
15.7	58.612	17.18 209	19.708 479	38.15 201	43.081 334	22.97 204	47.255 330	62.74 214
25.7	58.943 331	15.09 199	20.187 453	40.16 248	43.415 325	20.93 190	47.585 322	60.60 206
35.7	59.262 319	13.10	20.640	42.64	43.740	19.03	47.907	58.54
Mean Place	54.555	44.39	15.726	29.37	39.020	51.85	43.242	88.86
Sec δ , Tan δ	1.006	+0.113	1.703	-1.379	1.019	+0.194	1.002	+0.058
$D_{\phi} \alpha$, $D_{\phi} \delta$	+0.06	+0.01	+0.05	-0.09	+0.06	+0.01	+0.06	0.00
$D_{\phi} \delta$, $D_{\phi} \delta$	-0.4	+0.2	-0.4	+0.2	-0.4	+0.2	-0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Draconis. Mag. 4.1		ξ Hydre. Mag. 3.7		λ Centauri. Mag. 3.3		ν Leonis. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 26	° ' " +69 46	h m 11 28	° ' " -31 24	h m 11 31	° ' " -62 33	h m 11 32	° ' " - 0 22
Jan. 0.7	35.64	35.94	59.477	12.01	61.23	48.10	46.476	23.55
10.7	36.36 ⁷²	36.07 ¹³	59.819 ³⁴²	14.63 ²⁶²	61.77 ⁵⁴	50.64 ²⁵⁴	46.790 ³¹⁴	25.65 ²¹⁰
20.6	37.02 ⁶⁶	36.82 ⁷⁵	60.131 ³¹²	17.41 ²⁷⁸	62.26 ⁴⁹	53.60 ²⁹⁶	47.080 ²⁸⁰	27.62 ¹⁹⁷
30.6	37.61 ⁵⁹	38.14 ¹³²	60.404 ²⁷³	20.28 ²⁸⁷	62.68 ⁴²	56.87 ³²⁷	47.336 ²⁵⁶	29.41 ¹⁷⁹
Feb. 9.6	38.09 ⁴⁸	39.98 ¹⁸⁴	60.632 ²²⁸	23.16 ²⁸⁸	63.03 ³⁵	60.40 ³⁵³	47.552 ²¹⁶	30.98 ¹⁵⁵
19.6	38.46 ³⁷	42.24 ²²⁶	60.812 ¹⁸⁰	25.99 ²⁸³	63.30 ²⁷	64.06 ³⁶⁶	47.726 ¹⁷⁴	32.25 ¹²⁹
Mar. 1.5	38.72 ²⁶	44.84 ²⁶⁰	60.942 ¹³⁰	28.69 ²⁷⁰	63.49 ¹⁹	67.77 ³⁷¹	47.855 ¹²⁹	33.28 ¹⁰³
11.5	38.85 ¹³	47.64 ²⁸⁰	61.025 ⁸⁸	31.21 ²⁵²	63.59 ¹⁰	71.45 ³⁶⁸	47.941 ⁸⁶	34.04 ⁷⁶
21.5	38.86 ¹	50.54 ²⁹⁰	61.064 ³⁹	33.52 ²³¹	63.62 ³	75.01 ³⁵⁶	47.987 ⁴⁶	34.55 ⁵¹
31.5	38.74 ¹²	53.41 ²⁸⁷	61.062 ²	35.57 ²⁰⁶	63.58 ⁴	78.39 ³³⁸	47.996 ⁹	34.81 ²⁶
Apr. 10.4	38.52 ²²	56.14 ²⁷³	61.025 ³⁷	37.36 ¹⁷⁹	63.48 ¹⁰	81.51 ³¹²	47.973 ²³	34.88 ⁷
20.4	38.21 ³¹	58.61 ²⁴⁷	60.959 ⁶⁶	38.84 ¹⁴⁸	63.32 ¹⁶	84.32 ²⁸¹	47.924 ⁴⁹	34.76 ¹²
30.4	37.82 ³⁹	60.75 ²¹⁴	60.870 ⁸⁹	40.02 ¹¹⁸	63.10 ²²	86.77 ²⁴⁵	47.854 ⁷⁰	34.49 ²⁷
May 10.3	37.38 ⁴⁴	62.48 ¹⁷³	60.762 ¹⁰⁸	40.86 ⁸⁴	62.85 ²⁵	88.81 ²⁰⁴	47.771 ⁸³	34.11 ³⁸
20.3	36.89 ⁴⁹	63.75 ¹²⁷	60.639 ¹²⁸	41.40 ⁵⁴	62.56 ²⁹	90.40 ¹⁶⁹	47.676 ⁹⁵	33.63 ⁴⁸
30.3	36.39 ⁵⁰	64.52 ⁷⁷	60.509 ¹⁸⁰	41.59 ¹⁹	62.25 ³¹	91.51 ¹¹¹	47.576 ¹⁰⁰	33.07 ⁵⁶
June 9.3	35.87 ⁵²	64.76 ²⁴	60.373 ¹³⁶	41.47 ¹²	61.91 ³⁴	92.13 ⁶²	47.473 ¹⁰³	32.47 ¹⁰³
19.2	35.37 ⁵⁰	64.48 ²⁸	60.236 ¹³⁷	41.02 ⁴⁵	61.57 ³⁴	92.24 ¹¹	47.371 ¹⁰²	31.83 ¹⁰²
29.2	34.89 ⁴⁸	63.69 ⁷⁹	60.102 ¹³⁴	40.27 ⁷⁵	61.23 ³⁴	91.85 ³⁹	47.273 ⁹⁸	31.17 ⁹⁸
July 9.2	34.45 ³⁹	62.39 ¹³⁰	59.974 ¹²⁸	39.24 ¹⁰³	60.91 ³²	90.97 ⁸⁸	47.181 ⁹²	30.52 ⁹²
19.2	34.06 ³⁴	60.64 ²¹⁹	59.858 ¹⁰²	37.97 ¹²⁷	60.60 ³¹	89.62 ¹³⁵	47.099 ⁸²	29.89 ⁸²
29.1	33.72 ²⁸	58.45 ²⁵⁷	59.756 ⁸²	36.48 ¹⁴⁹	60.32 ²⁸	87.85 ¹⁷⁷	47.029 ⁷⁰	29.31 ⁷⁰
Aug. 8.1	33.44 ²⁰	55.88 ²⁸⁸	59.674 ⁵⁸	34.82 ¹⁶⁶	60.08 ²⁴	85.70 ²¹⁵	46.975 ⁵⁴	28.81 ⁵⁴
18.1	33.24 ¹²	53.00 ³¹⁸	59.616 ²⁸	33.07 ¹⁷⁵	59.90 ¹⁸	83.26 ²⁴⁴	46.939 ³⁶	28.40 ³⁶
28.0	33.12 ⁵	49.82 ³³⁷	59.588 ⁶	31.27 ¹⁸⁰	59.78 ¹²	80.59 ²⁶⁷	46.926 ¹³	28.13 ¹³
Sept. 7.0	33.07 ⁵	46.45 ³⁵³	59.594 ⁴⁴	29.51 ¹⁶⁴	59.73 ²	77.80 ²⁸¹	46.941 ⁴⁴	28.02 ⁴⁴
17.0	33.12 ¹³	42.92 ³⁶⁰	59.638 ⁸⁸	27.87 ¹⁴⁶	59.75 ¹¹	74.99 ²⁷²	46.985 ⁷⁹	28.11 ⁷⁹
27.0	33.25 ²³	39.32 ³⁶¹	59.726 ¹³⁴	26.41 ¹¹⁸	59.86 ²⁰	72.27 ²⁵¹	47.064 ¹¹⁶	28.43 ¹¹⁶
Oct. 6.9	33.48 ³³	35.71 ³⁵³	59.860 ¹⁸⁰	25.23 ⁸⁶	60.06 ³⁷	69.76 ²²¹	47.180 ¹⁹⁴	28.99 ¹⁹⁴
16.9	33.81 ⁴²	32.18 ³³⁹	60.040 ²²⁷	24.37 ⁴⁶	60.34 ²⁸	67.55 ¹⁸⁰	47.335 ¹⁵⁵	29.84 ¹⁵⁵
26.9	34.23 ⁵⁰	28.79 ³¹⁴	60.267 ²⁷⁰	23.91 ²	60.71 ⁴⁴	65.75 ¹³²	47.529 ²³²	30.96 ²³²
Nov. 5.9	34.73 ⁵⁹	25.65 ²⁸⁵	60.537 ³⁰⁸	23.89 ⁴⁴	61.15 ⁵⁰	64.43 ⁷⁵	47.761 ²⁶⁷	32.34 ²⁶⁷
15.8	35.32 ⁶⁵	22.80 ²⁴³	60.845 ³³⁸	24.33 ⁹¹	61.65 ⁵⁶	63.68 ¹⁵	48.028 ²⁹⁷	33.98 ²⁹⁷
25.8	35.97 ⁷¹	20.37 ¹⁹⁷	61.183 ³⁶¹	25.24 ¹³⁷	62.21 ⁵⁸	63.53 ⁴⁸	48.325 ³¹⁶	35.83 ³¹⁶
Dec. 5.8	36.68 ⁷⁴	18.40 ¹⁴¹	61.544 ³⁶⁹	26.61 ¹⁷⁹	62.79 ⁶⁰	64.01 ¹⁰⁹	48.641 ³²⁹	37.84 ³²⁹
15.7	37.42 ⁸⁵	16.99 ²³	61.913 ³⁶⁷	28.40 ²¹⁵	63.39 ⁵⁹	65.10 ¹⁶⁸	48.970 ³³¹	39.96 ³³¹
25.7	38.16 ⁷⁴	16.14 ²³	62.280 ³⁵⁴	30.55 ²⁴⁴	63.98 ⁵⁶	66.78 ²²¹	49.301 ³²²	42.12 ³²²
35.7	38.90 ⁷⁴	15.91 ²³	62.634 ³⁵⁴	32.99 ²⁴⁴	64.54 ⁵⁶	68.99 ²²¹	49.623 ³²²	44.26 ³²²
Mean Place	33.223	61.70	57.951	13.93	59.394	57.80	45.013	15.20
Sec δ , Tan δ	2.893	+2.715	1.172	-0.611	2.171	-1.927	1.000	-0.007
$D\delta a$, $D\alpha a$	+0.07	+0.18	+0.06	-0.04	+0.05	-0.13	+0.06	0.00
$D\delta \delta$, $D\alpha \delta$	-0.4	+0.1	-0.4	+0.1	-0.4	+0.1	-0.4	+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	π Chamæleontis. Mag. 5.7		δ Draconis. Mag. 5.5		ζ Crateris. Mag. 4.9		χ Ursæ Majoris. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° '	h m	° '	h m	° '	h m	° '
	11 33	-75 26	11 37	+67 11	11 40	-17 53	11 41	+48 13
	s	"	s	"	s	"	s	"
a. 0.7	54.62	21.81	56.81	29.88	37.694	43.63	45.225	39.99
10.7	55.52	24.13	57.47	29.79	38.021	46.05	45.652	39.25
20.7	56.33	26.94	58.09	30.33	38.322	48.51	46.051	39.06
30.6	57.02	30.16	58.63	31.44	38.589	50.94	46.409	39.40
b. 9.6	57.59	33.69	59.09	33.09	38.816	53.29	46.714	40.25
19.6	58.03	37.42	59.45	35.19	39.000	55.50	46.961	41.55
ur. 1.5	58.32	41.28	59.71	37.66	39.140	57.51	47.141	43.25
11.5	58.47	45.17	59.87	40.37	39.235	59.32	47.255	45.24
21.5	58.49	48.99	59.89	43.22	39.288	60.88	47.306	47.43
31.5	58.38	52.68	59.83	46.07	39.304	62.20	47.297	49.73
ur. 10.4	58.14	56.14	59.66	48.83	39.288	63.27	47.233	52.02
20.4	57.80	59.32	59.42	51.36	39.245	64.08	47.123	54.23
30.4	57.36	62.15	59.10	53.61	39.179	64.65	46.977	56.25
ay 10.4	56.84	64.59	58.73	55.48	39.096	64.98	46.800	58.02
20.3	56.24	66.56	58.32	56.90	39.001	65.08	46.604	59.49
30.3	55.58	68.05	57.88	57.85	38.897	64.96	46.394	60.60
ne 9.3	54.89	69.01	57.44	58.28	38.788	64.62	46.181	61.32
19.2	54.18	69.42	56.99	58.20	38.677	64.09	45.970	61.63
29.2	53.47	69.30	56.57	57.61	38.567	63.38	45.765	61.54
ly 9.2	52.78	68.63	56.17	56.53	38.464	62.51	45.574	61.03
19.2	52.13	67.44	55.81	54.97	38.365	61.50	45.402	60.13
29.1	51.54	65.76	55.50	52.97	38.280	60.39	45.251	58.83
ig. 8.1	51.02	63.65	55.23	50.59	38.211	59.21	45.127	57.18
18.1	50.61	61.17	55.03	47.85	38.160	58.02	45.034	55.19
28.1	50.32	58.42	54.89	44.81	38.134	56.87	44.976	52.92
pt. 7.0	50.16	55.47	54.83	41.54	38.135	55.79	44.958	50.37
17.0	50.15	52.44	54.85	38.09	38.171	54.86	44.983	47.61
27.0	50.30	49.44	54.95	34.53	38.244	54.14	45.056	44.67
t. 6.9	50.61	46.61	55.12	30.94	38.357	53.66	45.180	41.60
16.9	51.08	44.04	55.39	27.38	38.512	53.50	45.357	38.47
26.9	51.70	41.84	55.74	23.94	38.710	53.69	45.587	35.34
iv. 5.9	52.44	40.12	56.18	20.69	38.948	54.24	45.871	32.29
15.8	53.31	38.95	56.69	17.74	39.223	55.16	46.203	29.38
25.8	54.25	38.40	57.26	15.15	39.530	56.46	46.577	26.70
ic. 5.8	55.24	38.50	57.89	13.00	39.859	58.09	46.985	24.32
15.8	56.24	39.24	58.55	11.38	40.200	60.01	47.415	22.33
25.7	57.23	40.63	59.23	10.31	40.543	62.18	47.855	20.79
35.7	58.18	42.60	59.90	9.86	40.878	64.50	48.290	19.74
Place	52.188	33.40	54.764	55.68	36.267	41.30	43.628	62.78
l, Tan δ	3.979	-3.852	2.580	+2.378	1.050	-0.323	1.501	+1.120
D_{α}	+0.05	-0.25	+0.07	+0.16	+0.06	-0.02	+0.06	+0.07
D_{δ}	-0.4	+0.1	-0.4	+0.1	-0.4	+0.1	-0.4	+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Leonis. (Denebola.) Mag. 2.2		β Virginis. Mag. 3.8		Groombridge 1830. Mag. 6.5		γ Ursæ Majoris - Mag. 2.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 44	° ' " +15 1	h m 11 46	° ' " + 2 13	h m 11 48	° ' " +38 17	h m 11 49	° ' " +54 8
Jan. 0.7	54.123	36.20	26.823	27.61	16.935	65.75	33.093	38.36
10.7	54.450 ³²⁷	34.45 ¹⁷⁵	27.144 ³²¹	25.55 ²⁰⁶	17.324 ³⁸⁹	64.48 ¹²⁷	33.568 ⁴⁷⁵	37.73 ⁶³
20.7	54.753 ³⁰³	32.97 ¹⁴⁸	27.442 ²⁹⁸	23.64 ¹⁹¹	17.689 ³⁶⁵	63.69 ⁷⁹	34.013 ⁴⁴⁵	37.66 ⁷
30.6	55.025 ²⁷²	31.82 ¹¹⁵	27.709 ²⁶⁷	21.94 ¹⁷⁰	18.021 ³³²	63.39 ³⁰	34.416 ⁴⁰³	38.18 ¹⁰⁵
Feb. 9.6	55.259 ²³⁴	31.02 ⁸⁰	27.930 ²³⁰	20.49 ¹⁴⁵	18.307 ²⁸⁶	63.57 ¹⁸	34.763 ³⁴⁷	39.23 ¹⁶⁵
	191	47	188	117	224	63	280	132
19.6	55.450	30.55	28.127	19.32	18.541	64.20	35.043	40.75
Mar. 1.6	55.594 ¹⁴⁴	30.43 ¹²	28.272 ¹⁴⁵	18.43 ⁸⁹	18.721 ¹⁸⁰	65.22 ¹⁰²	35.254 ²¹¹	42.66 ¹⁹¹
11.5	55.694 ¹⁰⁰	30.61 ¹⁸	28.373 ¹⁰¹	17.82 ⁶¹	18.846 ¹²⁵	66.55 ¹³³	35.389 ¹³⁵	44.90 ²²⁴
21.5	55.750 ⁵⁶	31.04 ⁴³	28.434 ⁶¹	17.47 ³⁵	18.916 ⁷⁰	68.13 ¹⁵⁸	35.452 ⁶³	47.33 ²⁴³
31.5	55.766 ¹⁶	31.70 ⁶⁶	28.457 ²³	17.36 ¹¹	18.935 ¹⁹	69.87 ¹⁷⁴	35.445 ⁷	49.85 ²⁵²
	18	80	8	8	27	179	69	252
Apr. 10.4	55.748	32.50	28.449	17.44	18.908	71.66	35.376	52.37
20.4	55.702 ⁴⁶	33.42 ⁹²	28.412 ³⁷	17.70 ²⁶	18.843 ⁶⁵	73.43 ¹⁷⁷	35.251 ¹²⁵	54.77 ²⁴⁰
30.4	55.632 ⁷⁰	34.38 ⁹⁶	28.355 ⁵⁷	18.09 ³⁹	18.748 ⁹⁵	75.08 ¹⁶⁶	35.081 ¹⁷⁰	56.96 ²¹⁹
May 10.4	55.545 ⁸⁷	35.35 ⁹⁷	28.279 ⁷⁶	18.58 ⁴⁹	18.626 ¹²²	76.58 ¹⁵⁰	34.875 ²⁰⁶	58.89 ¹⁹³
20.3	55.446 ⁹⁹	36.29 ⁹⁴	28.192 ⁸⁷	19.15 ⁵⁷	18.488 ¹³⁸	77.85 ¹²⁷	34.644 ²³¹	60.45 ¹⁸⁶
	107	87	96	61	149	100	248	118
30.3	55.339	37.16	28.097	19.76	18.339	78.85	34.396	61.63
June 9.3	55.228 ¹¹¹	37.93 ⁷⁷	27.998 ⁹⁹	20.40 ⁶⁴	18.185 ¹⁵⁴	79.53 ⁶⁸	34.140 ²⁵⁶	62.38 ⁷⁵
19.3	55.116 ¹¹²	38.56 ⁶³	27.898 ¹⁰⁰	21.05 ⁶⁵	18.031 ¹⁵⁴	79.88 ³⁵	33.883 ²⁵⁷	62.69 ³¹
29.2	55.008 ¹⁰⁸	39.08 ⁵²	27.799 ⁹⁹	21.68 ⁶³	17.882 ¹⁴¹	79.89 ¹	33.633 ²⁵⁰	62.54 ¹⁵
July 9.2	54.905 ¹⁰³	39.44 ³⁶	27.704 ⁹⁵	22.28 ⁶⁰	17.741 ¹⁴¹	79.55 ³⁴	33.397 ²³⁶	61.95 ⁵⁹
	94	18	86	54	128	68	216	103
19.2	54.811	39.62	27.618	22.82	17.613	78.87	33.181	60.92
29.1	54.729 ⁸²	39.64 ²	27.541 ⁷⁷	23.30 ⁴⁸	17.503 ¹¹⁰	77.84 ¹⁰³	32.990 ¹⁹¹	59.47 ¹⁴⁵
Aug. 8.1	54.663 ⁶⁶	39.46 ¹⁸	27.479 ⁶²	23.68 ³⁸	17.412 ⁹¹	76.49 ¹³⁵	32.828 ¹⁶²	57.64 ¹⁸³
18.1	54.615 ⁴⁸	39.10 ³⁶	27.434 ⁴⁵	23.94 ²⁶	17.346 ⁶⁶	74.83 ¹⁶⁶	32.702 ¹²⁶	55.45 ²¹⁹
28.1	54.589 ²⁶	38.52 ⁵⁸	27.411 ²³	24.06 ¹²	17.308 ³⁸	72.88 ¹⁹⁵	32.615 ⁸⁷	52.95 ²⁵⁰
	0	80	2	5	6	221	42	277
Sept. 7.0	54.589	37.72	27.413	24.01	17.302	70.67	32.573	50.18
17.0	54.620 ³¹	36.72 ¹⁰⁰	27.445 ³²	23.75 ²⁶	17.333 ³¹	68.22 ²⁴⁵	32.580 ⁷	47.17 ³⁰¹
27.0	54.686 ⁶⁶	35.46 ¹²⁶	27.512 ⁶⁷	23.27 ⁴⁸	17.405 ⁷²	65.55 ²⁶⁷	32.641 ⁶¹	44.00 ³¹⁷
Oct. 7.0	54.788 ¹⁰²	34.00 ¹⁴⁶	27.615 ¹⁰³	22.54 ⁷³	17.521 ¹¹⁶	62.72 ²⁸³	32.760 ¹¹⁹	40.72 ³²⁸
16.9	54.930 ¹⁴²	32.31 ¹⁶⁹	27.758 ¹⁴³	21.56 ⁹⁸	17.683 ¹⁶²	59.78 ²⁹⁴	32.938 ¹⁷⁸	37.39 ³³³
	183	189	183	125	210	301	240	331
26.9	55.113	30.42	27.941	20.31	17.893	56.77	33.178	34.08
Nov. 5.9	55.336 ²²³	28.36 ²⁰⁶	28.164 ²²³	18.81 ¹⁵⁰	18.149 ²⁵⁶	53.75 ³⁰²	33.476 ²⁹⁸	30.87 ³²¹
15.8	55.597 ²⁶¹	26.19 ²¹⁷	28.423 ²⁵⁹	17.07 ¹⁷⁴	18.449 ³⁰⁰	50.79 ²⁹⁶	33.830 ³⁵⁴	27.85 ³⁰²
25.8	55.890 ²⁹³	23.93 ²²⁶	28.713 ²⁹⁰	15.15 ¹⁹²	18.788 ³³⁹	47.97 ²⁸²	34.233 ⁴⁰³	25.07 ²⁷⁸
Dec. 5.8	56.206 ³¹⁶	21.67 ²²¹	29.028 ³¹⁵	13.08 ²⁰⁷	19.156 ³⁶⁸	45.36 ²⁶¹	34.677 ⁴⁴⁴	22.66 ²⁴¹
	332	221	328	215	390	232	470	200
15.8	56.538	19.46	29.356	10.93	19.546	43.04	35.147	20.66
25.7	56.876 ³³⁸	17.38 ²⁰⁸	29.689 ³³³	8.76 ²¹⁷	19.945 ³⁹⁹	41.09 ¹⁹⁵	35.630 ⁴⁸³	19.16 ¹⁵⁰
35.7	57.208 ³³²	15.49 ¹⁸⁹	30.016 ³²⁷	6.66 ²¹⁰	20.341 ³⁹⁶	39.56 ¹⁵³	36.111 ⁴⁸¹	18.19 ⁹⁷
Mean Place	52.715	49.80	25.436	36.88	15.477	86.30	31.522	62.45
Sec δ , Tan δ	1.035	+0.268	1.001	+0.039	1.274	+0.790	1.707	+1.384
$D\alpha$, $D\alpha$	+0.06	+0.02	+0.06	0.00	+0.06	+0.05	+0.06	+0.09
$D\delta$, $D\delta$	-0.4	+0.1	-0.4	+0.1	-0.4	+0.1	-0.4	0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Virginis. Mag. 4.6		\circ Virginis. Mag. 4.2		δ Centauri. Mag. 2.9		ϵ Corvi. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 56	° ' + 7 3	h m 12 1	° ' + 9 10	h m 12 4	° ' -50 15	h m 12 5	° ' -22 9
	s 11 56	"	s 12 1	"	s 12 4	"	s 12 5	"
Jan. 0.7	41.580	66.70	3.264	66.24	7.509	49.69	55.585	50.38
10.7	41.905 325	64.72 198	3.590 326	64.30 194	7.954 445	51.99 230	55.928 343	52.72 234
20.7	42.208 303	62.95 177	3.896 306	62.59 171	8.368 414	54.65 266	56.249 321	55.15 243
30.6	42.483 275	61.44 151	4.175 279	61.15 144	8.740 372	57.60 295	56.538 289	57.62 247
Feb. 9.6	42.721 238	60.22 122	4.417 242	60.02 113	9.062 322	60.75 315	56.791 253	60.05 243
	198	93	201	80	267	326	211	234
19.6	42.919	59.29	4.618	59.22	9.329	64.01	57.002	62.39
Mar. 1.6	43.073 154	58.69 60	4.776 158	58.72 50	9.537 208	67.30 329	57.169 167	64.59 220
11.5	43.184 111	58.38 31	4.891 115	58.54 18	9.687 150	70.57 327	57.294 125	66.59 200
21.5	43.253 69	58.33 5	4.964 9	58.63 9	9.780 93	73.72 315	57.376 82	68.39 180
31.5	43.284 31	58.52 19	4.999 35	58.96 33	9.821 41	76.70 298	57.421 45	69.95 156
	1	38	2	50	8	276	10	133
Apr. 10.5	43.283	58.90	5.001	59.46	9.813	79.46	57.431	71.28
20.4	43.252 31	59.44 54	4.973 28	60.13 67	9.763 50	81.95 249	57.411 20	72.36 108
30.4	43.199 53	60.08 64	4.922 51	60.88 75	9.673 90	84.12 217	57.366 45	73.19 83
May 10.4	43.127 72	60.81 73	4.851 71	61.69 81	9.550 123	85.96 184	57.300 66	73.77 58
20.3	43.041 86	61.56 75	4.766 85	62.52 83	9.399 151	87.41 145	57.218 82	74.10 33
	95	75	95	81	175	104	96	9
30.3	42.946	62.31	4.671	63.33	9.224	88.45	57.122	74.19
June 9.3	42.846 100	63.04 73	4.570 101	64.10 77	9.032 192	89.08 63	57.017 105	74.04 15
19.3	42.742 104	63.71 67	4.465 105	64.80 70	8.828 204	89.27 19	56.905 112	73.68 36
29.2	42.639 103	64.33 62	4.361 104	65.42 62	8.615 213	89.03 24	56.790 115	73.10 58
July 9.2	42.540 99	64.87 54	4.258 103	65.94 52	8.403 212	88.35 68	56.674 116	72.31 79
	93	44	96	39	207	107	112	95
19.2	42.447	65.31	4.162	66.33	8.196	87.28	56.562	71.36
29.2	42.363 84	65.63 32	4.074 88	66.58 25	8.002 194	85.84 144	56.458 104	70.26 110
Aug. 8.1	42.293 70	65.81 18	4.000 74	66.69 11	7.829 173	84.06 178	56.366 92	69.05 121
18.1	42.238 55	65.85 4	3.940 60	66.64 5	7.684 145	82.01 205	56.290 76	67.77 128
28.1	42.204 34	65.72 13	3.901 39	66.39 25	7.577 107	79.77 224	56.237 53	66.49 128
	9	33	13	44	62	237	23	125
Sept. 7.0	42.195	65.39	3.888	65.95	7.515	77.40	56.214	65.24
17.0	42.216 21	64.85 54	3.903 15	65.29 66	7.505 10	75.00 240	56.223 9	64.10 114
27.0	42.270 54	64.08 77	3.951 48	64.40 89	7.553 48	72.67 233	56.229 46	63.12 98
Oct. 7.0	42.360 90	63.08 100	4.038 87	63.27 113	7.665 112	70.50 217	56.357 88	62.37 75
16.9	42.491 131	61.83 125	4.164 126	61.91 136	7.842 177	68.59 191	56.491 134	61.90 47
	172	148	168	161	244	155	180	13
26.9	42.663	60.35	4.332	60.30	8.086	67.04	56.671	61.77
Nov. 5.9	42.875 212	58.63 172	4.541 209	58.49 181	8.390 304	65.92 112	56.895 224	62.00 23
15.9	43.126 251	56.72 191	4.789 248	56.50 199	8.750 360	65.29 63	57.161 266	62.62 62
25.8	43.408 282	54.66 206	5.069 280	54.37 213	9.156 406	65.19 10	57.462 301	63.62 100
Dec. 5.8	43.718 310	52.50 216	5.377 308	52.17 220	9.596 440	65.66 47	57.790 345	64.99 137
	325	219	325	221	459	101	345	171
15.8	44.043	50.31	5.702	49.96	10.055	66.67	58.135	66.70
25.7	44.376 333	48.16 215	6.035 333	47.81 215	10.520 465	68.21 154	58.487 352	68.68 198
35.7	44.706 330	46.11 205	6.366 331	45.78 203	10.976 456	70.22 201	58.835 348	70.90 222
Mean Place	40.255	77.65	1.965	77.93	6.083	57.26	54.288	49.63
Sec δ , Tan δ	1.008	+0.124	1.013	+0.162	1.565	-1.203	1.080	-0.407
$D\phi a$, $D\omega a$	+0.06	+0.01	+0.06	+0.01	+0.06	-0.08	+0.06	-0.03
$D\phi \delta$, $D\omega \delta$	-0.4	0.0	-0.4	0.0	-0.4	0.0	-0.4	0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	4 H. Draconis. Mag. 5.1		δ Crucis. Mag. 3.1		δ Ursae Majoris. Mag. 3.4		γ Corvi. Mag. 2.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 8	° ' " +78 3	h m 12 10	° ' " -58 17	h m 12 11	° ' " +57 28	h m 12 11	° ' " -17 5
Jan. 0.7	24.25	51.55	48.693	25.94	23.908	52.58	36.444	14.30
10.7	25.40 ¹¹⁵	51.36 ¹⁹	49.215 ⁵²²	28.07 ²¹³	24.419 ⁵¹¹	51.79 ⁷⁹	36.780 ³³⁶	16.57 ²²⁷
20.7	26.49 ¹⁰⁹	51.85 ⁴⁹	49.703 ⁴⁸⁸	30.63 ²⁵⁶	24.907 ⁴⁸⁸	51.60 ¹⁹	37.096 ³¹⁶	18.90 ²³³
30.6	27.51 ¹⁰²	52.95 ¹¹⁰	50.145 ⁴⁴²	33.55 ²⁹²	25.357 ⁴⁵⁰	52.01 ⁴¹	37.384 ²⁸⁸	21.22 ²³²
Feb. 9.6	28.40 ⁸⁹	54.63 ¹⁶⁸	50.528 ³⁸³	36.73 ³¹⁸	25.752 ³⁹⁵	53.00 ⁹⁹	37.637 ²⁵³	23.45 ²²³
19.6	29.14 ⁷⁴	56.81 ²¹⁸	50.847 ³¹⁹	40.09 ³³⁶	26.082 ³³⁰	54.50 ¹⁵⁰	37.849 ²¹²	25.55 ²¹⁰
Mar. 1.6	29.68 ⁵⁴	59.40 ²⁵⁹	51.099 ²⁵²	43.55 ³⁴⁶	26.340 ²⁵⁸	56.45 ¹⁹⁵	38.019 ¹⁷⁰	27.49 ¹⁹⁴
11.5	30.04 ³⁶	62.28 ²⁸⁸	51.281 ¹⁸²	47.03 ³⁴⁸	26.519 ¹⁷⁹	58.74 ²²⁹	38.147 ¹²⁸	29.21 ¹⁷²
21.5	30.19 ¹⁵	65.34 ³⁰⁶	51.399 ¹¹⁸	50.45 ³⁴²	26.620 ¹⁰¹	61.28 ²⁵⁴	38.236 ⁸⁹	30.72 ¹⁵¹
31.5	30.15 ⁴	68.44 ³¹⁰	51.452 ⁵³	53.74 ³²⁹	26.645 ²⁵	63.95 ²⁶⁷	38.286 ⁵⁰	31.98 ¹²⁶
Apr. 10.5	29.91 ²⁴	71.45 ³⁰¹	51.445 ⁷	56.82 ³⁰⁸	26.599 ⁴⁶	66.64 ²⁶⁹	38.302 ¹⁶	33.01 ¹⁰⁸
20.4	29.50 ⁴¹	74.27 ²⁸²	51.383 ⁶²	59.66 ²⁸⁴	26.489 ¹¹⁰	69.24 ²⁶⁰	38.288 ¹⁴	33.80 ⁷⁹
30.4	28.93 ⁵⁷	76.80 ²⁵³	51.273 ¹¹⁰	62.19 ²⁵³	26.326 ¹⁶³	71.66 ²⁴²	38.251 ³⁷	34.38 ⁵⁸
May 10.4	28.23 ⁷⁰	78.94 ²¹⁴	51.119 ¹⁵⁴	64.38 ²¹⁹	26.118 ²⁰⁸	73.81 ²¹⁵	38.193 ⁵⁸	34.73 ³⁵
20.3	27.43 ⁸⁰	80.64 ¹⁷⁰	50.929 ¹⁹⁰	66.17 ¹⁷⁹	25.874 ²⁴⁴	75.62 ¹⁸¹	38.117 ⁷⁶	34.87 ¹⁴
30.3	26.56 ⁸⁷	81.83 ¹¹⁹	50.706 ²²³	67.55 ¹³⁸	25.606 ²⁶⁸	77.03 ¹⁴¹	38.029 ⁸⁸	34.81 ⁶
June 9.3	25.64 ⁹²	82.49 ⁶⁶	50.459 ²⁴⁷	68.46 ⁹¹	25.322 ²⁸⁴	78.01 ⁹⁸	37.931 ⁹⁸	34.55 ²⁶
19.3	24.71 ⁹³	82.59 ¹⁰	50.193 ²⁶⁶	68.91 ⁴⁵	25.030 ²⁹²	78.52 ⁵¹	37.826 ¹⁰⁵	34.12 ⁴³
29.2	23.78 ⁹³	82.13 ⁴⁶	49.916 ²⁷⁷	68.89 ²	24.740 ²⁹⁰	78.56 ⁴	37.717 ¹⁰⁹	33.52 ⁶⁰
July 9.2	22.88 ⁹⁰	81.14 ⁹⁹	49.635 ²⁸¹	68.40 ⁴⁹	24.458 ²⁸²	78.12 ⁴⁴	37.608 ¹⁰⁹	32.77 ⁷⁵
19.2	22.03 ⁸⁵	79.63 ¹⁵¹	49.360 ²⁷⁵	67.46 ⁹⁴	24.193 ²⁸⁵	77.21 ⁹¹	37.502 ¹⁰⁶	31.90 ⁸⁷
29.2	21.27 ⁷⁶	77.64 ¹⁹⁹	49.101 ²⁵⁹	66.08 ¹³⁸	23.949 ²⁴⁴	75.85 ¹³⁶	37.402 ¹⁰⁰	30.93 ¹⁰⁰
Aug. 8.1	20.59 ⁶⁸	75.21 ²⁴³	48.865 ²³⁶	64.30 ¹⁷⁸	23.733 ²¹⁶	74.03 ¹⁷⁷	37.312 ⁹⁰	29.88 ¹⁰⁰
18.1	20.01 ⁵⁸	72.39 ²⁸²	48.664 ²⁰¹	62.20 ²¹⁰	23.554 ¹⁷⁹	71.91 ²¹⁷	37.239 ⁷³	28.82 ¹⁰⁰
28.1	19.55 ⁴⁶	69.24 ³¹⁵	48.508 ¹⁵⁶	59.82 ²³⁸	23.414 ¹⁴⁰	69.39 ²⁵²	37.185 ⁵⁴	27.77 ¹⁰⁰
Sept. 7.0	19.23 ³²	65.81 ³⁴³	48.410 ⁹⁸	57.28 ²⁵⁴	23.321 ⁹³	66.57 ²⁸²	37.158 ²⁷	26.79 ⁹¹
17.0	19.04 ¹⁹	62.19 ³⁶²	48.374 ³⁶	54.65 ²⁶³	23.280 ⁴¹	63.50 ³⁰⁷	37.162 ⁴	25.92 ⁸⁷
27.0	19.00 ⁴	58.44 ³⁷⁵	48.411 ³⁷	52.05 ²⁶⁰	23.297 ¹⁷	60.23 ³²⁷	37.202 ⁴⁰	25.24 ⁶⁶
Oct. 7.0	19.13 ¹³	54.63 ³⁸¹	48.524 ¹¹³	49.55 ²⁵⁰	23.375 ⁷⁸	56.82 ³⁴¹	37.282 ⁸⁰	24.77 ⁴⁷
16.9	19.42 ²⁹	50.84 ³⁷⁹	48.717 ¹⁹³	47.29 ²²⁶	23.521 ¹⁴⁶	53.34 ³⁴⁸	37.407 ¹²⁵	24.59 ¹⁸
26.9	19.86 ⁴⁴	47.17 ³⁶⁷	48.990 ²⁷³	45.36 ¹⁹³	23.733 ²¹²	49.86 ³⁴⁸	37.576 ¹⁶⁹	24.72 ¹³
Nov. 5.9	20.47 ⁶¹	43.70 ³⁴⁷	49.339 ³⁴⁹	43.85 ¹⁵¹	24.013 ²⁸⁰	46.47 ³³⁹	37.789 ²¹³	25.18 ⁴⁶
15.9	21.22 ⁷⁵	40.53 ³¹⁷	49.753 ⁴¹⁴	42.84 ¹⁰¹	24.356 ³⁴³	43.24 ³²³	38.043 ²⁵⁴	26.01 ⁸³
25.8	22.11 ⁸⁹	37.73 ²⁹⁰	50.225 ⁴⁷²	42.37 ⁴⁷	24.758 ⁴⁰²	40.28 ²⁹⁶	38.332 ²⁸⁹	27.19 ¹¹⁸
Dec. 5.8	23.12 ¹⁰¹	35.38 ²³⁵	50.736 ⁵¹¹	42.49 ¹²	25.208 ⁴⁵⁰	37.67 ²⁶¹	38.649 ³¹⁷	28.69 ¹³⁰
15.8	24.22 ¹¹⁰	33.58 ¹⁸⁰	51.274 ⁵³⁸	43.20 ⁷¹	25.696 ⁴⁸⁸	35.48 ²¹⁹	38.985 ³³⁶	30.47 ¹⁷⁸
25.7	25.36 ¹¹⁴	32.37 ¹²¹	51.819 ⁵⁴⁵	44.47 ¹²⁷	26.204 ⁵⁰⁸	33.78 ¹⁷⁰	39.329 ³⁴⁴	32.50 ²⁰³
35.7	26.52 ¹¹⁶	31.80 ⁵⁷	52.353 ⁵³⁴	46.28 ¹⁸¹	26.718 ⁵¹⁴	32.65 ¹¹³	39.670 ³⁴¹	34.68 ²¹⁸
Mean Place	22.495	78.70	47.240	35.39	22.601	77.49	35.186	11.84
Sec δ , Tan δ	4.836	+4.732	1.903	-1.619	1.860	+1.569	1.047	-0.907
$D\psi a$, $D_{\omega} a$	+0.06	+0.32	+0.06	-0.11	+0.06	+0.10	+0.06	-0.02
$D\psi \delta$, $D_{\omega} \delta$	-0.4	0.0	-0.4	0.0	-0.4	0.0	-0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	2 Canum Venat. Mag. 5.8		β Chamæleontis. Mag. 4.4		η Virginis. Mag. 4.0		α^1 Crucis. Mag. 1.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 12	" ' s +41 6	h m 12 13	" ' s -78 51	h m 12 15	" ' s - 0 12	h m 12 22	" ' s -62 38
	s	"	s	"	s	"	s	"
l. 0.7	2.617	37.77	32.34	12.30	43.851	48.72	2.90	30.99
10.7	3.014 ³⁹⁷	36.52 ¹²⁵	33.58 ¹²⁴	14.03 ¹⁷³	44.178 ³²⁷	50.82 ²¹⁰	3.49 ⁵⁹	32.91 ¹⁹²
20.7	3.391 ³⁷⁷	35.78 ⁷⁴	34.73 ¹¹⁵	16.31 ²²⁸	44.487 ³⁰⁹	52.81 ¹⁹⁹	4.05 ⁵⁶	35.31 ²⁴⁰
30.7	3.737 ³⁴⁶	35.57 ²¹	35.78 ¹⁰⁵	19.06 ²⁷⁵	44.771 ²⁸⁴	54.61 ¹⁸⁰	4.56 ⁵¹	38.09 ²⁷⁸
b. 9.6	4.043 ³⁰⁶	35.87 ³⁰	36.69 ⁹¹	22.21 ³¹⁵	45.021 ²⁵⁰	56.18 ¹⁵⁷	5.01 ⁴⁵	41.21 ³¹²
	256 ⁷⁸		74 ⁷⁴	346 ³⁴⁶	211 ²¹¹	131 ¹³¹	38 ³⁸	333 ³³³
19.6	4.299 ²⁰³	36.65 ¹²²	37.43 ⁵⁸	25.67 ³⁶⁶	45.232 ¹⁷⁰	57.49 ¹⁰³	5.39 ²⁹	44.54 ³⁴⁸
r. 1.6	4.502 ¹⁴⁷	37.87 ¹⁵⁹	38.01 ⁴¹	29.33 ³⁸⁰	45.402 ¹²⁹	58.52 ⁷⁵	5.68 ²³	48.02 ³⁵⁴
11.5	4.649 ⁸⁹	39.46 ¹⁸⁵	38.42 ²⁴	33.13 ³⁸³	45.531 ⁹⁰	59.27 ⁴⁹	5.91 ¹⁶	51.56 ³⁵¹
21.5	4.738 ³⁸	41.31 ²⁰⁴	38.66 ⁷	36.96 ³⁸⁰	45.621 ⁵²	59.76 ²³	6.07 ⁸	55.07 ³⁴²
31.5	4.776 ¹²	43.35 ²¹⁵	38.73 ¹⁰	40.76 ³⁶⁷	45.673 ¹⁸	59.99 ³	6.15 ¹	58.49 ³²⁷
r. 10.5	4.764 ⁵⁴	45.50 ²¹³	38.63 ²⁶	44.43 ³⁴⁵	45.691 ¹⁰	60.02 ¹⁷	6.16 ⁵	61.76 ³⁰³
20.4	4.710 ⁹⁰	47.63 ²⁰⁵	38.37 ⁴⁰	47.88 ³²⁰	45.681 ³⁵	59.85 ³²	6.11 ¹¹	64.79 ²⁷⁶
30.4	4.620 ¹²¹	49.68 ¹⁸⁹	37.97 ⁵³	51.08 ²⁸⁶	45.646 ⁵⁴	59.53 ⁴³	6.00 ¹⁸	67.55 ²⁴¹
y 10.4	4.499 ¹⁴³	51.57 ¹⁶⁶	37.44 ⁶⁶	53.94 ²⁴⁷	45.592 ⁷¹	59.10 ⁵³	5.82 ²¹	69.96 ²⁰⁴
20.4	4.356 ¹⁶⁰	53.23 ¹³⁸	36.78 ⁷⁵	56.41 ²⁰¹	45.521 ⁸³	58.57 ⁵⁹	5.61 ²⁵	72.00 ¹⁶²
30.3	4.196 ¹⁷⁰	54.61 ¹⁰⁵	36.03 ⁸³	58.42 ¹⁵³	45.438 ⁹²	57.98 ⁶⁴	5.36 ²⁸	73.62 ¹¹⁶
ne 9.3	4.026 ¹⁷⁵	55.66 ⁷⁰	35.20 ⁸⁹	59.95 ¹⁰⁰	45.346 ⁹⁷	57.34 ⁶⁶	5.08 ³¹	74.78 ⁶⁹
19.3	3.851 ¹⁷⁵	56.36 ³³	34.31 ⁹³	60.95 ⁴⁵	45.249 ¹⁰¹	56.68 ⁶⁴	4.77 ³³	75.47 ²⁰
29.2	3.676 ¹⁷⁰	56.69 ³	33.38 ⁹⁵	61.40 ¹⁰²	45.148 ⁹⁹	56.02 ⁶¹	4.44 ³³	75.67 ³⁰
ly 9.2	3.506 ¹⁶¹	56.66 ⁴³	32.43 ⁹²	61.31 ⁶⁵	45.046 ⁹⁹	55.38 ⁶¹	4.11 ³³	75.37 ⁷⁹
19.2	3.345 ¹⁴⁹	56.23 ⁸⁰	31.51 ⁸⁸	60.66 ¹¹⁸	44.947 ⁹²	54.77 ⁵⁵	3.78 ³³	74.58 ¹²⁴
29.2	3.196 ¹³¹	55.43 ¹¹⁶	30.63 ⁸⁰	59.48 ¹⁶⁶	44.855 ⁸⁴	54.22 ⁴⁸	3.45 ²⁹	73.34 ¹⁶⁸
g. 8.1	3.065 ¹⁰⁸	54.27 ¹⁵²	29.83 ⁶⁹	57.82 ²¹³	44.771 ⁶⁸	53.74 ³⁸	3.16 ²⁶	71.66 ²⁰⁴
18.1	2.957 ⁸¹	52.75 ¹⁸²	29.14 ⁵⁴	55.69 ²⁵¹	44.703 ⁵¹	53.36 ²⁴	2.90 ²⁰	69.62 ²³⁵
28.1	2.876 ⁵¹	50.93 ²¹³	28.60 ⁴⁰	53.18 ²⁷⁸	44.652 ²⁶	53.12 ⁹	2.70 ¹⁴	67.27 ²⁵⁸
pt. 7.1	2.825 ¹³	48.80 ²³⁹	28.20 ²¹	50.40 ²⁹⁷	44.626 ¹	53.03 ¹⁰	2.56 ⁷	64.69 ²⁷⁰
17.0	2.812 ²⁹	46.41 ²⁶³	27.99 ⁰	47.43 ³⁰⁷	44.627 ³⁶	53.13 ³³	2.49 ¹	61.99 ²⁷³
27.0	2.841 ⁷⁴	43.78 ²⁸¹	27.99 ²¹	44.36 ³⁰¹	44.663 ⁷³	53.46 ⁵⁵	2.50 ¹⁰	59.26 ²⁶⁵
t. 7.0	2.915 ¹²³	40.97 ²⁹⁴	28.20 ⁴²	41.35 ²⁸⁷	44.736 ¹¹⁴	54.01 ⁸²	2.60 ¹⁹	56.61 ²⁴⁵
16.9	3.038 ¹⁷⁴	38.03 ³⁰⁴	28.62 ⁶³	38.48 ²⁵⁸	44.850 ¹⁵⁵	54.83 ¹⁰⁸	2.79 ²⁹	54.16 ²¹⁶
26.9	3.212 ²²⁵	34.99 ³⁰⁴	29.25 ⁸²	35.90 ²²⁰	45.005 ²⁰⁰	55.91 ¹³⁴	3.08 ³⁷	52.00 ¹⁷⁸
v. 5.9	3.437 ²⁷³	31.95 ²⁹⁹	30.07 ⁹⁸	33.70 ¹⁷³	45.205 ²³⁸	57.25 ¹⁶⁰	3.45 ⁴⁵	50.22 ¹²⁹
15.9	3.710 ³¹⁸	28.96 ²⁸⁶	31.05 ¹¹²	31.97 ¹¹⁶	45.443 ²⁷³	58.85 ¹⁸¹	3.90 ⁵²	48.93 ⁷⁵
25.8	4.028 ³⁵⁴	26.10 ²⁶³	32.17 ¹²²	30.81 ⁵⁷	45.716 ³⁰²	60.66 ¹⁹⁸	4.42 ⁵⁶	48.18 ¹⁷
c. 5.8	4.382 ³⁸⁰	23.47 ²³⁴	33.39 ¹²⁸	30.24 ⁹	46.018 ³²¹	62.64 ²¹¹	4.98 ⁵⁹	48.01 ⁴³
15.8	4.762 ³⁹⁷	21.13 ¹⁹⁷	34.67 ¹³⁰	30.33 ⁷²	46.339 ³³⁰	64.75 ²¹⁵	5.57 ⁶²	48.44 ¹⁰³
25.8	5.159 ³⁹⁹	19.16 ¹⁵²	35.97 ¹²⁸	31.05 ¹³⁵	46.669 ³³⁰	66.90 ²¹⁵	6.19 ⁶⁰	49.47 ¹⁵⁷
35.7	5.558	17.64	37.25	32.40	46.999	69.05	6.79	51.04
Place	1.371	59.21	30.277	24.92	42.637	40.33	1.495	41.42
Tan δ	1.327	+0.873	5.175	-5.078	1.000	-0.004	2.177	-1.933
$D_{\omega} \alpha$	+0.06	+0.06	+0.07	-0.34	+0.06	0.00	+0.06	-0.13
$D_{\omega} \delta$	-0.4	-0.1	-0.4	-0.1	-0.4	-0.1	-0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	20 Comæ. Mag. 5.7			δ Corvi. Mag. 3.1			γ Crucis. Mag. 1.6			8 Canum Venat. Mag. 4.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	12 25		+21 20	12 25		-16 3	12 26		-56 39	12 29		+41 47
Jan. 0.7	37.368		44.49	38.345		35.26	37.647		5.16	52.209		48.59
10.7	37.711	343	42.69	38.684	339	37.49	38.163	516	7.13	52.667	398	47.21
20.7	38.040	329	41.24	39.006	322	39.75	38.650	487	9.53	53.052	385	46.34
30.7	38.344	304	40.19	39.301	295	42.00	39.095	445	12.28	53.409	357	46.01
Feb. 9.6	38.614	270	39.53	39.563	262	44.17	39.490	395	15.32	53.729	320	46.22
		232			224			335			273	
19.6	38.846		39.29	39.787		46.20	39.825		18.55	54.002		46.93
Mar. 1.6	39.035	189	39.44	39.971	184	48.06	40.097	272	21.89	54.224	222	48.11
11.6	39.178	143	39.93	40.114	143	49.71	40.306	209	25.26	54.391	167	49.68
21.5	39.278	100	40.74	40.216	102	51.14	40.452	146	28.60	54.503	112	51.56
31.5	39.336	58	41.79	40.281	65	52.34	40.536	84	31.83	54.560	57	53.67
		20			31			27			8	
Apr. 10.5	39.356		43.03	40.312		53.31	40.563		34.87	54.568		55.89
20.4	39.343	13	44.37	40.314	2	54.05	40.536	27	37.70	54.531	37	58.14
30.4	39.302	41	45.75	40.289	25	54.59	40.461	75	40.24	54.455	76	60.32
May 10.4	39.237	65	47.12	40.243	46	54.90	40.342	119	42.46	54.347	108	62.35
20.4	39.153	84	48.42	40.178	65	55.03	40.186	156	44.33	54.212	135	64.18
		98			79			189			154	
30.3	39.055		49.60	40.099		54.97	39.997		45.78	54.058		65.74
June 9.3	38.946	109	50.64	40.007	92	54.72	39.778	219	46.81	53.888	170	66.97
19.3	38.829	117	51.49	39.907	100	54.32	39.538	240	47.39	53.710	178	67.83
29.3	38.710	119	52.13	39.800	107	53.77	39.283	255	47.52	53.526	184	68.34
July 9.2	38.590	120	52.55	39.691	109	53.07	39.020	263	47.18	53.346	180	68.45
		115			110			262			176	
19.2	38.475		52.73	39.581		52.27	38.758		46.39	53.170		68.17
29.2	38.364	111	52.68	39.476	105	51.37	38.505	263	45.17	53.005	165	67.49
Aug. 8.1	38.263	101	52.36	39.379	97	50.41	38.270	235	43.56	52.853	152	66.44
18.1	38.177	86	51.79	39.296	83	49.43	38.064	206	41.62	52.722	131	65.03
28.1	38.110	67	50.96	39.232	64	48.46	37.899	165	39.39	52.616	106	63.27
		43			40			117			77	
Sept. 7.1	38.067		49.88	39.192		47.55	37.782		36.98	52.539		61.19
17.0	38.054	13	48.55	39.183	9	46.75	37.725	57	34.45	52.499	40	58.83
27.0	38.074	20	46.96	39.209	26	46.14	37.736	11	31.91	52.498	1	56.21
Oct. 7.0	38.133	59	45.14	39.275	66	45.73	37.820	84	29.45	52.546	48	53.39
17.0	38.234	101	43.10	39.385	110	45.59	37.981	161	27.20	52.642	96	50.39
		144			155			240			149	
26.9	38.378		40.88	39.540		45.74	38.221		25.25	52.791		47.30
Nov. 5.9	38.569	191	38.50	39.740	200	46.22	38.534	313	23.68	52.993	202	44.18
15.9	38.801	232	36.03	39.983	243	47.04	38.918	384	22.59	53.246	253	41.10
25.8	39.072	271	33.51	40.262	279	48.20	39.358	440	22.02	53.547	301	38.13
Dec. 5.8	39.376	304	31.02	40.573	311	49.67	39.843	485	22.01	53.888	341	35.36
		328			330			514			371	
15.8	39.704		28.63	40.903		51.42	40.357		22.57	54.259		32.88
25.8	40.046	342	26.43	41.245	342	53.39	40.883	526	23.69	54.650	391	30.78
35.7	40.390	344	24.46	41.587	342	55.53	41.408	525	25.34	55.050	400	29.10
Mean Place	36.235		60.23	37.167		32.55	36.333		14.41	51.194		70.22
Sec δ, Tan δ	1.074		+0.391	1.041		-0.288	1.820		-1.520	1.341		+0.894
Dψ α, Dω α	+0.06		+0.03	+0.06		-0.02	+0.07		-0.10	+0.06		+0.06
Dψ δ, Dω δ	-0.4		-0.1	-0.4		-0.1	-0.4		-0.1	-0.4		-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington on Time.	κ Draconis. Mag. 3.9		β Corvi. Mag. 2.8		24 Comae seq. Mag. 5.2		α Muscae. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 29	° ' " +70 13	h m 12 30	° ' " -22 56	h m 12 31	° ' " +18 49	h m 12 32	° ' " -68 40
n. 0.7	60.50	57.74	5.716	36.67	2.140	26.75	18.00	50.51
10.7	61.25	57.06	6.067	38.88	2.480	24.89	18.74	52.18
20.7	61.98	57.04	6.401	41.20	2.807	23.35	19.43	54.38
30.7	62.65	57.65	6.709	43.58	3.109	22.18	20.07	57.02
b. 9.6	63.26	58.88	6.982	45.94	3.380	21.40	20.63	60.03
19.6	63.78	60.65	7.217	48.24	3.614	21.01	21.11	63.31
ar. 1.6	64.19	62.90	7.411	50.40	3.805	21.00	21.50	66.81
11.6	64.48	65.52	7.562	52.41	3.952	21.36	21.81	70.41
21.5	64.66	68.39	7.673	54.22	4.057	22.02	22.02	74.03
31.5	64.71	71.38	7.745	55.82	4.121	22.93	22.13	77.61
pr. 10.5	64.65	74.39	7.782	57.20	4.149	24.04	22.16	81.06
20.4	64.48	77.30	7.789	58.33	4.144	25.27	22.11	84.33
30.4	64.20	79.99	7.767	59.24	4.109	26.56	21.99	87.33
ay 10.4	63.85	82.38	7.723	59.91	4.052	27.86	21.79	90.02
20.4	63.43	84.38	7.657	60.35	3.975	29.11	21.52	92.35
30.3	62.96	85.94	7.576	60.54	3.884	30.26	21.20	94.25
me 9.3	62.45	87.00	7.481	60.52	3.781	31.29	20.82	95.70
19.3	61.92	87.55	7.375	60.26	3.670	32.16	20.41	96.67
29.3	61.39	87.56	7.261	59.81	3.554	32.84	19.98	97.11
ly 9.2	60.86	87.04	7.142	59.14	3.437	33.33	19.53	97.04
19.2	60.36	86.00	7.024	58.30	3.322	33.59	19.08	96.47
29.2	59.88	84.47	6.909	57.31	3.210	33.62	18.65	95.39
lg. 8.1	59.44	82.47	6.803	56.19	3.109	33.42	18.24	93.83
18.1	59.06	80.06	6.710	54.98	3.021	32.99	17.89	91.87
28.1	58.75	77.27	6.636	53.74	2.952	32.30	17.59	89.55
pt. 7.1	58.52	74.14	6.588	52.51	2.905	31.37	17.37	86.94
17.0	58.36	70.76	6.572	51.36	2.887	30.18	17.24	84.16
27.0	58.28	67.18	6.594	50.34	2.902	28.75	17.21	81.29
rt. 7.0	58.31	63.47	6.658	49.53	2.956	27.07	17.31	78.46
17.0	58.44	59.71	6.768	48.96	3.050	25.18	17.51	75.76
26.9	58.68	55.98	6.925	48.70	3.189	23.07	17.83	73.34
rv. 5.9	59.01	52.37	7.130	48.79	3.372	20.81	18.26	71.27
15.9	59.45	48.98	7.379	49.24	3.599	18.42	18.79	69.65
25.8	59.98	45.89	7.666	50.07	3.865	15.96	19.41	68.58
xc. 5.8	60.59	43.19	7.986	51.27	4.163	13.51	20.09	68.08
15.8	61.29	40.97	8.328	52.82	4.486	11.12	20.81	68.19
25.8	62.01	39.30	8.682	54.64	4.822	8.89	21.56	68.91
35.7	62.75	38.24	9.035	56.72	5.165	6.88	22.30	70.22
n Place	59.501	84.39	4.551	36.34	1.042	41.66	16.617	62.05
, Tan δ	2.957	+2.783	1.086	-0.423	1.057	+0.341	2.751	-2.563
, D _u α	+0.05	+0.18	+0.06	-0.03	+0.06	+0.02	+0.07	-0.17
, D _u δ	-0.4	-0.1	-0.4	-0.1	-0.4	-0.1	-0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Virginis. Mag. 4.8			γ Centauri. Mag. 2.4			γ Virginis (mean). Mag. 2.9			ρ Virginis. Mag. 5.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 12 35	° ' " 7 32	° ' "	h m 12 36	° ' " 48 30	° ' "	h m 12 37	° ' " 0 59	° ' "	h m 12 37	° ' " 10 40	° ' "
	s	"	s	s	"	s	s	"	s	"	"	"
Jan. 0.7	1.840	45.86	60.444	27.48	31.414	67.40	45.150	61.90				
10.7	2.174 ³³⁴	48.00 ²¹⁴	60.894 ⁴⁵⁰	29.43 ¹⁹⁵	31.745 ³³¹	69.49 ²⁰⁹	45.484 ³³⁴	59.90 ²⁰⁰				
20.7	2.492 ³¹⁸	50.11 ²¹¹	61.323 ⁴²⁹	31.75 ²³²	32.061 ³¹⁶	71.49 ²⁰⁰	45.806 ³²²	58.14 ¹⁷⁶				
30.7	2.787 ²⁹⁵	52.11 ²⁰⁰	61.718 ³⁹⁵	34.39 ²⁸⁴	32.354 ²⁹³	73.31 ¹⁸²	46.104 ²⁹⁸	56.66 ¹⁴⁸				
Feb. 9.6	3.051 ²⁶⁴	53.96 ¹⁸⁵	62.072 ³⁵⁴	37.24 ²⁶⁵	32.618 ²⁶⁴	74.91 ¹⁶⁰	46.372 ²⁶⁸	55.51 ¹¹⁵				
	227	164	305	299	227	135	233	80				
19.6	3.278	55.60	62.377	40.23	32.845	76.26	46.605	54.71				
Mar. 1.6	3.468 ¹⁹⁰	57.02 ¹⁴²	62.629 ²⁵²	43.33 ³¹⁰	33.035 ¹⁹⁰	77.33 ¹⁰⁷	46.797 ¹⁹²	54.22 ⁴⁹				
11.6	3.618 ¹⁵⁰	58.18 ¹¹⁶	62.828 ¹⁹⁹	46.41 ³⁰⁸	33.184 ¹⁴⁹	78.12 ⁷⁹	46.949 ¹⁵²	54.11 ¹¹				
21.5	3.728 ¹¹⁰	59.10 ⁹²	62.975 ¹⁴⁷	49.41 ³⁰⁰	33.295 ¹¹¹	78.65 ⁵³	47.060 ¹¹¹	54.29 ¹⁸				
31.5	3.801 ⁷³	59.77 ⁶⁷	63.070 ⁹⁵	52.30 ²⁸⁹	33.368 ⁷³	78.92 ²⁷	47.133 ⁷³	54.72 ⁴³				
	40	46	47	271	42	5	37	65				
Apr. 10.5	3.841	60.23	63.117	55.01	33.410	78.97	47.170	55.37				
20.4	3.851 ¹⁰	60.46 ²³	63.120 ³	57.50 ²⁴⁹	33.419 ⁹	78.83 ¹⁴	47.176 ⁶	56.18 ⁸¹				
30.4	3.834 ¹⁷	60.52 ⁶	63.083 ³⁷	59.72 ²²²	33.402 ¹⁷	78.52 ³¹	47.155 ²¹	57.09 ⁹¹				
May 10.4	3.797 ³⁷	60.42 ¹⁰	63.010 ⁷³	61.65 ¹⁹³	33.364 ³⁸	78.09 ⁴³	47.112 ⁴³	58.06 ⁹⁷				
20.4	3.741 ⁵⁶	60.17 ²⁵	62.904 ¹⁰⁶	63.24 ¹⁵⁹	33.308 ⁵⁶	77.56 ⁵³	47.048 ⁶⁴	59.06 ¹⁰⁰				
	72	36	134	123	73	60	78	97				
30.3	3.669	59.81	62.770	64.47	33.235	76.96	46.970	60.03				
June 9.3	3.585 ⁸⁴	59.34 ⁴⁷	62.612 ¹⁵⁸	65.31 ⁸⁴	33.151 ⁸⁴	76.32 ⁶⁴	46.880 ⁹⁰	60.94 ⁹¹				
19.3	3.492 ⁹³	58.79 ⁵⁵	62.435 ¹⁷⁷	65.77 ⁴⁶	33.057 ⁹⁴	75.66 ⁶⁶	46.781 ⁹⁹	61.77 ⁸³				
29.3	3.392 ¹⁰⁰	58.18 ⁶¹	62.243 ¹⁹²	65.81 ⁴	32.957 ¹⁰⁰	74.99 ⁶⁷	46.675 ¹⁰⁶	62.48 ⁷¹				
July 9.2	3.286 ¹⁰⁶	57.50 ⁶⁸	62.042 ²⁰¹	65.44 ³⁷	32.853 ¹⁰⁴	74.33 ⁶⁶	46.567 ¹⁰⁸	63.07 ⁵⁹				
	104	71	202	76	105	62	109	45				
19.2	3.182	56.79	61.840	64.68	32.748	73.71	46.458	63.52				
29.2	3.080 ¹⁰²	56.08 ⁷¹	61.640 ²⁰⁰	63.55 ¹¹³	32.645 ¹⁰³	73.14 ⁵⁷	46.353 ¹⁰⁵	63.80 ²⁸				
Aug. 8.1	2.984 ⁹⁶	55.40 ⁶⁸	61.453 ¹⁸⁷	62.08 ¹⁴⁷	32.549 ⁹⁶	72.65 ⁴⁹	46.255 ⁹⁸	63.91 ¹¹				
18.1	2.900 ⁸⁴	54.74 ⁶⁶	61.287 ¹⁶⁶	60.31 ¹⁷⁷	32.464 ⁸⁵	72.25 ⁴⁰	46.168 ⁸⁷	63.84 ⁷				
28.1	2.834 ⁶⁶	54.16 ⁵⁸	61.149 ¹³⁸	58.31 ²⁰⁰	32.397 ⁶⁷	71.98 ²⁷	46.099 ⁶⁹	63.55 ²⁹				
	45	46	99	218	48	13	49	49				
Sept. 7.1	2.789	53.70	61.050	56.13	32.349	71.85	46.050	63.06				
17.0	2.772 ¹⁷	53.37 ³³	60.999 ⁵¹	53.89 ²²⁴	32.330 ¹⁹	71.89 ⁴	46.029 ²¹	62.34 ⁷²				
27.0	2.789 ¹⁷	53.25 ¹²	61.001 ²	51.65 ²²⁴	32.342 ¹²	72.16 ²⁷	46.041 ¹²	61.39 ⁹⁵				
Oct. 7.0	2.844 ⁵⁵	53.34 ⁹	61.063 ⁶²	49.52 ²¹³	32.391 ⁴⁹	72.64 ⁴⁸	46.088 ⁴⁷	60.18 ¹²¹				
17.0	2.941 ⁹⁷	53.69 ³⁵	61.192 ¹²⁹	47.57 ¹⁹⁵	32.483 ⁹²	73.38 ⁷⁴	46.177 ⁸⁹	58.75 ¹⁴³				
	139	63	194	165	135	100	133	168				
26.9	3.080	54.32	61.386	45.92	32.618	74.38	46.310	57.07				
Nov. 5.9	3.266 ¹⁸⁶	55.23 ⁹¹	61.643 ²⁵⁷	44.65 ¹²⁷	32.797 ¹⁷⁹	75.65 ¹²⁷	46.486 ¹⁷⁶	55.19 ¹⁸⁸				
15.9	3.493 ²²⁷	56.45 ¹²²	61.961 ³¹⁸	43.81 ⁸⁴	33.017 ²²⁰	77.18 ¹⁵³	46.705 ²¹⁹	53.12 ²⁰⁷				
25.8	3.758 ²⁶⁵	57.92 ¹⁴⁷	62.331 ³⁷⁰	43.46 ³⁵	33.276 ²⁵⁹	78.93 ¹⁷⁵	46.963 ²⁵⁸	50.93 ²¹⁹				
Dec. 5.8	4.055 ²⁹⁷	59.65 ¹⁷³	62.742 ⁴¹¹	43.62 ¹⁶	33.565 ²⁸⁹	80.85 ¹⁹²	47.252 ²⁸⁹	48.65 ²²⁸				
	319	191	440	69	315	206	315	229				
15.8	4.374	61.56	63.182	44.31	33.880	82.91	47.567	46.36				
25.8	4.706 ³³²	63.61 ²⁰⁵	63.638 ⁴⁵⁶	45.50 ¹¹⁹	34.207 ³²⁷	85.04 ²¹³	47.897 ³³⁰	44.13 ²²³				
35.7	5.040 ³³⁴	65.73 ²¹²	64.090 ⁴⁵²	47.17 ¹⁶⁷	34.538 ³³¹	87.17 ²¹³	48.230 ³³³	42.04 ²⁰⁹				
Mean Place	0.730	40.18	59.248	34.89	30.329	59.39	44.086	74.00				
Sec δ , Tan δ	1.009	-0.133	1.509	-1.131	1.000	-0.017	1.018	+0.189				
$D\psi\alpha$, $D\omega\alpha$	+0.06	-0.01	+0.07	-0.07	+0.06	0.00	+0.06	+0.01				
$D\psi\delta$, $D\omega\delta$	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2				

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	76 Ursæ Majoris. Mag. 5.9		β Crucis. Mag. 1.5		31 Comæ. Mag. 5.1		γ Centauri. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	° '	h m	° '	h m	° '	h m	° '
	12 37	+63 9	12 42	-59 14	12 47	+27 58	12 48	-39 43
n. 0.8	60.17	21.31	56.331	16.94	43.286	54.19	54.470	54.31
10.7	60.76	20.36	56.887	18.66	43.643	52.39	54.876	56.24
20.7	61.33	20.02	57.418	20.83	43.989	50.99	55.266	58.48
30.7	61.87	20.32	57.910	23.40	44.315	50.04	55.629	60.95
b. 9.6	62.35	21.25	58.352	26.28	44.610	49.55	55.958	63.59
19.6	62.77	22.73	58.736	29.41	44.868	49.53	56.244	66.31
ar. 1.6	63.11	24.71	59.056	32.69	45.083	49.95	56.486	69.06
11.6	63.37	27.08	59.309	36.04	45.253	50.76	56.682	71.76
21.5	63.52	29.75	59.495	39.40	45.378	51.91	56.832	74.36
31.5	63.60	32.59	59.618	42.68	45.460	53.33	56.937	76.83
pr. 10.5	63.58	35.50	59.678	45.84	45.500	54.95	57.001	79.12
20.5	63.49	38.34	59.679	48.79	45.504	56.67	57.027	81.18
30.4	63.32	41.04	59.627	51.49	45.474	58.43	57.018	83.01
ay 10.4	63.10	43.46	59.524	53.90	45.418	60.15	56.979	84.57
20.4	62.82	45.55	59.375	55.96	45.336	61.77	56.910	85.83
30.3	62.50	47.25	59.188	57.63	45.237	63.24	56.817	86.79
me 9.3	62.14	48.49	58.964	58.89	45.121	64.49	56.701	87.41
19.3	61.77	49.25	58.711	59.70	44.996	65.52	56.568	87.70
29.3	61.40	49.51	58.438	60.05	44.863	66.27	56.420	87.66
ly 9.2	61.03	49.25	58.150	59.92	44.724	66.75	56.262	87.27
19.2	60.66	48.50	57.858	59.33	44.587	66.92	56.099	86.56
29.2	60.33	47.26	57.571	58.29	44.454	66.78	55.937	85.55
ig. 8.2	60.02	45.55	57.290	56.83	44.328	66.34	55.782	84.25
18.1	59.74	43.42	57.055	55.01	44.216	65.58	55.641	82.72
28.1	59.50	40.89	56.850	52.86	44.121	64.51	55.523	81.00
pt. 7.1	59.32	38.03	56.696	50.47	44.050	63.16	55.434	79.17
17.0	59.20	34.87	56.604	47.92	44.006	61.51	55.383	77.29
27.0	59.14	31.49	56.583	45.32	43.998	59.61	55.378	75.44
st. 7.0	59.15	27.92	56.640	42.77	44.029	57.45	55.425	73.70
17.0	59.25	24.27	56.782	40.36	44.103	55.08	55.527	72.17
26.0	59.43	20.61	57.008	38.22	44.224	52.52	55.687	70.91
iv. 5.9	59.68	17.00	57.314	36.43	44.394	49.84	55.904	69.99
15.9	60.02	13.57	57.700	35.08	44.610	47.09	56.175	69.48
25.9	60.43	10.39	58.150	34.22	44.869	44.32	56.495	69.42
xc. 5.8	60.91	7.53	58.652	33.92	45.166	41.62	56.855	69.80
15.8	61.43	5.12	59.192	34.18	45.492	39.09	57.242	70.67
25.8	62.00	3.23	59.751	35.01	45.839	36.77	57.647	71.97
35.7	62.58	1.90	60.311	36.39	46.194	34.76	58.055	73.67
Place	59.283	47.10	55.130	26.87	42.331	71.88	53.375	59.39
h, Tan δ	2.214	+1 976	1.956	-1.680	1.132	+0.531	1.300	-0.831
D_{α}	+0.05	+0.13	+0.07	-0.11	+0.06	+0.03	+0.07	-0.05
D_{δ}	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Ursæ Majoris. (Alioth.) Mag. 1.7		δ Virginis. Mag. 3.7		α Can. Ven. seq. Mag. 2.9		δ Muscæ. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 50	° ' " +56 23	h m 12 51	° ' " + 3 50	h m 12 52	° ' " +38 44	h m 12 56	° ' " -71 6
	s	"	s	"	s	"	s	"
Jan. 0.8	26.350	52.28	29.323	24.55	12.540	78.81	37.46	12.63
10.7	26.848 498	51.00 128	29.654 331	22.49 206	12.927 387	77.15 166	38.29 83	13.91 128
20.7	27.337 489	50.33 87	29.975 321	20.57 192	13.305 378	76.00 115	39.09 80	15.74 183
30.7	27.801 464	50.28 5	30.274 299	18.88 169	13.661 356	75.37 63	39.84 75	18.05 231
Feb. 9.6	28.224 423	50.85 57	30.548 274	17.45 143	13.987 326	75.28 9	40.53 69	20.77 277
	369	114	238	113	285	43	59	306
19.6	28.593	51.99	30.786	16.32	14.272	75.71	41.12	23.83
Mar. 1.6	28.900 307	53.65 166	30.987 201	15.50 82	14.511 239	76.62 91	41.63 61	27.12 329
11.6	29.136 236	55.73 208	31.149 162	14.97 53	14.699 188	77.96 134	42.04 41	30.60 348
21.5	29.302 166	58.14 241	31.273 124	14.75 22	14.835 136	79.66 170	42.35 21	34.19 359
31.5	29.393 91	60.80 266	31.360 87	14.78 3	14.922 87	81.61 195	42.56 31	37.76 357
	22	275	53	26	39	214	12	330
Apr. 10.5	29.415	63.55	31.413	15.04	14.961	83.75	42.68	41.26
20.5	29.371 44	66.31 276	31.434 21	15.48 44	14.957 4	85.95 220	42.70 2	44.64 338
30.4	29.269 102	68.98 267	31.429 5	16.07 59	14.914 43	88.14 219	42.62 8	47.82 318
May 10.4	29.118 151	71.43 245	31.400 29	16.77 70	14.836 78	90.24 210	42.46 16	50.71 289
20.4	28.921 197	73.61 218	31.351 49	17.52 75	14.732 104	92.17 193	42.22 24	53.28 257
	229	184	67	79	129	169	32	219
30.3	28.692	75.45	31.284	18.31	14.603	93.86	41.90	55.47
June 9.3	28.435 257	76.88 143	31.205 79	19.10 79	14.458 145	95.28 142	41.52 38	57.23 178
19.3	28.161 274	77.87 99	31.113 92	19.86 76	14.297 161	96.36 108	41.09 43	58.54 131
29.3	27.876 285	78.40 53	31.013 100	20.57 71	14.130 167	97.10 74	40.62 47	59.33 79
July 9.2	27.588 288	78.44 4	30.907 106	21.23 66	13.957 173	97.46 36	40.12 60	59.60 27
	284	44	109	57	172	0	52	24
19.2	27.304	78.00	30.798	21.80	13.785	97.46	39.60	59.36
29.2	27.031 273	77.09 91	30.690 108	22.27 47	13.619 166	97.06 40	39.09 51	58.60 76
Aug. 8.2	26.777 254	75.71 138	30.587 103	22.63 36	13.461 158	96.27 79	38.60 49	57.34 126
18.1	26.547 230	73.91 180	30.492 95	22.84 21	13.318 143	95.12 115	38.15 45	55.62 172
28.1	26.350 197	71.71 220	30.413 79	22.90 6	13.196 122	93.62 150	37.76 39	53.50 212
	158	256	59	12	97	184	31	246
Sept. 7.1	26.192	69.15	30.354	22.78	13.099	91.78	37.45	51.04
17.0	26.080 112	66.28 287	30.321 33	22.46 32	13.036 63	89.63 215	37.25 20	48.34 270
27.0	26.022 58	63.14 314	30.318 3	21.93 53	13.010 26	87.21 242	37.14 11	45.48 286
Oct. 7.0	26.024 2	59.79 335	30.353 35	21.15 78	13.028 18	84.53 268	37.16 2	42.58 260
17.0	26.089 65	56.29 350	30.429 76	20.13 102	13.094 66	81.67 286	37.31 15	39.76 283
	135	356	120	127	118	302	30	263
26.9	26.224	52.73	30.549	18.86	13.212	78.65	37.61	37.14
Nov. 5.9	26.428 204	49.18 355	30.713 164	17.35 151	13.381 169	75.55 310	38.03 42	34.79 235
15.9	26.702 274	45.73 345	30.920 207	15.60 175	13.604 223	72.44 311	38.56 53	32.87 192
25.9	27.039 337	42.46 327	31.168 248	13.68 192	13.876 272	69.41 303	39.21 65	31.41 146
Dec. 5.8	27.434 395	39.49 297	31.449 281	11.59 209	14.190 314	66.52 289	39.93 72	30.54 87
	441	261	307	215	348	264	79	30
15.8	27.875	36.88	31.756	9.44	14.538	63.88	40.72	30.24
25.8	28.350 475	34.74 214	32.080 324	7.26 218	14.910 372	61.56 232	41.54 82	30.54 30
35.7	28.843 493	33.12 162	32.409 329	5.15 211	15.293 383	59.64 192	42.38 84	31.44 90
Mean Place	25.584	76.89	28.329	34.19	11.666	99.51	36.333	24.63
Sec δ , Tan δ	1.807	+1.505	1.002	+0.067	1.282	+0.803	3.089	-2.923
$D\psi a$, $D_m a$	+0.05	+0.10	+0.06	0.00	+0.06	+0.05	+0.08	-0.19
$D\psi \delta$, $D_m \delta$	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	ϵ Virginis. Mag. 3.0		θ Virginis. Mag. 4.4		43 Comae. Mag. 4.3		20 Canum. Venat. Mag. 4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 58	° ' +11 23	h m 13 5	° ' - 5 6	h m 13 8	° ' +28 17	h m 13 13	° ' +40 59
	s 6.633	" 46.37	s 43.070	" 11.85	s 3.718	" 19.23	s 52.799	" 53.70
a. 0.8	6.633	46.37	43.070	11.85	3.718	19.23	52.799	53.70
10.7	6.967 ³³⁴	44.34 ²⁰³	43.404 ³³⁴	13.93 ²⁰⁸	4.072 ³⁵⁴	17.32 ¹⁹¹	53.191 ³⁹²	51.90 ¹⁸⁰
20.7	7.293 ³²⁶	42.54 ¹⁸⁰	43.731 ³²⁷	15.95 ²⁰²	4.420 ³⁴⁸	15.83 ¹⁴⁹	53.580 ³⁸⁹	50.61 ¹²⁹
30.7	7.599 ³⁰⁶	41.03 ¹⁵¹	44.038 ³⁰⁷	17.85 ¹⁹⁰	4.752 ³³²	14.79 ¹⁰⁴	53.953 ³⁷³	49.86 ⁷⁵
b. 9.7	7.879 ²⁸⁰	39.88 ¹¹⁵	44.320 ²⁸²	19.57 ¹⁷²	5.057 ³⁰⁵	14.22 ⁵⁷	54.299 ³⁴⁶	49.67 ¹⁹
	246	80	250	150	271	8	309	36
19.6	8.125	39.08	44.570	21.07	5.328	14.14	54.608	50.03
r. 1.6	8.334 ²⁰⁹	38.63 ⁴⁵	44.784 ²¹⁴	22.33 ¹²⁶	5.560 ²³²	14.51 ³⁷	54.873 ²⁶⁵	50.92 ⁸⁹
11.6	8.504 ¹⁷⁰	38.53 ¹⁰	44.961 ¹⁷⁷	23.33 ¹⁰⁰	5.749 ¹⁸⁹	15.31 ⁸⁰	55.090 ²¹⁷	52.26 ¹³⁴
21.6	8.634 ¹³⁰	38.75 ²²	45.102 ¹⁴¹	24.07 ⁷⁴	5.894 ¹⁴⁵	16.47 ¹¹⁶	55.255 ¹⁶⁵	54.00 ¹⁷⁴
31.5	8.728 ⁹⁴	39.24 ⁴⁹	45.206 ¹⁰⁴	24.57 ⁵⁰	5.996 ¹⁰²	17.93 ¹⁴⁶	55.370 ¹¹⁵	56.03 ²⁰³
	57	72	71	26	60	168	65	224
r. 10.5	8.785	39.96	45.277	24.83	6.056	19.61	55.435	58.27
20.5	8.809 ²⁴	40.85 ⁸⁹	45.317 ⁴⁰	24.89 ⁶	6.079 ²³	21.42 ¹⁸¹	55.454 ¹⁹	60.62 ²³⁵
30.4	8.806 ³	41.86 ¹⁰¹	45.329 ¹²	24.79 ¹⁰	6.068 ¹¹	23.30 ¹⁸⁸	55.431 ²³	62.98 ²³⁶
y 10.4	8.777 ²⁹	42.93 ¹⁰⁷	45.318 ¹¹	24.52 ²⁷	6.027 ⁴¹	25.15 ¹⁸⁵	55.369 ⁶²	65.28 ²³⁰
20.4	8.728 ⁴⁹	44.02 ¹⁰⁹	45.284 ³⁴	24.15 ³⁷	5.959 ⁶⁸	26.93 ¹⁷⁸	55.277 ⁹²	67.40 ²¹²
	68	106	52	47	88	162	122	192
30.4	8.660	45.08	45.232	23.68	5.871	28.55	55.155	69.32
ne 9.3	8.577 ⁸³	46.09 ¹⁰¹	45.162 ⁷⁰	23.14 ⁵⁴	5.763 ¹⁰⁸	29.98 ¹⁴³	55.011 ¹⁴⁴	70.94 ¹⁶²
19.3	8.482 ⁹⁵	47.00 ⁹¹	45.079 ⁸³	22.54 ⁶⁰	5.640 ¹²³	31.18 ¹²⁰	54.849 ¹⁶²	72.23 ¹²⁹
29.3	8.377 ¹⁰⁵	47.79 ⁷⁹	44.985 ⁹⁴	21.91 ⁶³	5.507 ¹³³	32.11 ⁹³	54.874 ¹⁷⁵	73.17 ⁹⁴
ly 9.2	8.266 ¹¹¹	48.44 ⁶⁵	44.881 ¹⁰⁴	21.26 ⁶⁵	5.367 ¹⁴⁰	32.74 ⁶³	54.491 ¹⁸³	73.71 ⁵⁴
	114	50	109	65	145	33	188	14
19.2	8.152	48.94	44.772	20.61	5.222	33.07	54.303	73.85
29.2	8.038 ¹¹⁴	49.27 ³³	44.661 ¹¹¹	19.98 ⁶³	5.077 ¹⁴⁵	33.09 ²	54.116 ¹⁸⁷	73.58 ²⁷
ig. 8.2	7.928 ¹¹⁰	49.40 ¹³	44.552 ¹⁰⁹	19.39 ⁵⁹	4.937 ¹⁴⁰	32.78 ³¹	53.936 ¹⁸⁰	72.91 ⁶⁷
18.1	7.826 ¹⁰²	49.35 ⁵	44.451 ¹⁰¹	18.85 ⁵⁴	4.806 ¹³¹	32.15 ⁶³	53.768 ¹⁶⁸	71.84 ¹⁰⁷
28.1	7.739 ⁸⁷	49.07 ²⁸	44.361 ⁹⁰	18.41 ⁴⁴	4.691 ¹¹⁵	31.21 ⁹⁴	53.616 ¹⁵²	70.39 ¹⁴⁵
	67	48	69	34	94	127	126	181
pt. 7.1	7.672	48.59	44.292	18.07	4.597	29.94	53.490	68.58
17.1	7.629 ⁴³	47.86 ⁷³	44.247 ⁴⁵	17.90 ¹⁷	4.530 ⁶⁷	28.37 ¹⁵⁷	53.393 ⁹⁷	66.43 ²¹⁵
27.0	7.619 ¹⁰	46.89 ⁹⁷	44.234 ¹³	17.91 ¹	4.496 ³⁴	26.53 ¹⁸⁴	53.335 ⁵⁸	63.97 ²⁴⁶
t. 7.0	7.645 ²⁶	45.67 ¹²²	44.258 ²⁴	18.13 ²²	4.501 ⁵	24.42 ²¹¹	53.321 ¹⁴	61.26 ²⁷¹
17.0	7.712 ⁶⁷	44.22 ¹⁴⁵	44.323 ⁶⁵	18.58 ⁴⁵	4.549 ⁴⁸	22.08 ²³⁴	53.356 ³⁵	58.32 ²⁶⁴
	111	170	110	73	96	255	88	312
26.9	7.823	42.52	44.433	19.31	4.645	19.53	53.444	55.20
v. 5.9	7.980 ¹⁵⁷	40.61 ¹⁹¹	44.589 ¹⁵⁶	20.29 ⁹⁸	4.790 ¹⁴⁵	16.84 ²⁶⁹	53.588 ¹⁴⁴	52.00 ³²⁰
15.9	8.181 ²⁰¹	38.52 ²⁹⁹	44.790 ²⁰¹	21.55 ¹²⁶	4.984 ¹⁹⁴	14.06 ²⁷⁸	53.787 ¹⁹⁹	48.77 ³²³
25.9	8.423 ²⁴²	36.29 ²²³	45.032 ²⁴²	23.05 ¹⁵⁰	5.224 ²⁴⁰	11.25 ²⁸¹	54.039 ²⁵²	45.59 ³¹⁸
c. 5.8	8.700 ²⁷⁷	33.98 ²³¹	45.309 ²⁷⁷	24.78 ¹⁷³	5.504 ²⁸⁰	8.49 ²⁷⁶	54.338 ²⁹⁹	42.56 ³⁰³
	305	232	306	189	313	262	339	280
15.8	9.005	31.66	45.615	26.67	5.817	5.87	54.677	39.76
25.8	9.329 ³²⁴	29.39 ²²⁷	45.939 ³²⁴	28.68 ²⁰¹	6.154 ³³⁷	3.47 ²⁴⁰	55.045 ³⁶⁸	37.28 ²⁴⁸
35.8	9.661 ³³²	27.26 ²¹³	46.271 ³³²	30.75 ²⁰⁷	6.505 ³⁵¹	1.37 ²¹⁰	55.430 ³⁸⁵	35.21 ²⁰⁷
Place	5.700	58.57	42.139	5.53	2.921	36.76	52.143	74.61
tan δ	1.020	+0.202	1.004	-0.089	1.135	+0.538	1.325	+0.869
D_{α}	+0.06	+0.01	+0.06	-0.01	+0.06	+0.03	+0.05	+0.06
D_{δ}	-0.4	-0.3	-0.4	-0.3	-0.4	-0.3	-0.4	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Hydræ. Mag. 3.3			ι Centauri. Mag. 2.9			ζ^1 Ursæ Majoris. (Mizar.) Mag. 2.4			α Virginis. (Spica.) Mag. 1.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 13 14	s 13 14	° ' " -22 44	h m 13 15	s 13 15	° ' " -36 16	h m 13 20	s 13 20	° ' " +55 20	h m 13 20	s 13 20	° ' " -10 44
Jan. 0.8	28.513		21.39	59.756		44.30	38.051		47.98	53.106		5.26
10.7	28.871	358	23.31	60.152	398	46.01	38.530	479	46.34	53.445	339	7.26
20.7	29.219	348	25.37	60.539	387	48.01	39.011	481	45.29	53.778	333	9.28
30.7	29.550	331	27.51	60.906	367	50.23	39.477	466	44.89	54.095	317	11.23
Feb. 9.7	29.854	304	29.66	61.242	336	52.60	39.912	435	45.10	54.387	292	13.08
		271			302			391			263	
19.6	30.125		31.75	61.544		55.05	40.303		45.92	54.650		14.75
Mar. 1.6	30.362	237	33.75	61.806	262	57.52	40.641	338	47.30	54.880	230	16.24
11.6	30.560	198	35.61	62.027	221	59.96	40.916	275	49.17	55.074	194	17.50
21.6	30.719	159	37.30	62.205	178	62.31	41.125	209	51.46	55.231	157	18.54
31.5	30.842	123	38.82	62.343	138	64.54	41.264	139	54.03	55.352	121	19.35
		89			98			73			90	
Apr. 10.5	30.931	55	40.14	62.441	61	66.60	41.337	8	56.78	55.442	57	19.93
20.5	30.986	25	41.24	62.502	28	68.49	41.345	8	59.60	55.499	29	20.32
30.4	31.011	2	42.16	62.528	26	70.16	41.293	52	62.40	55.528	29	20.51
May 10.4	31.009	27	42.85	62.521	7	71.60	41.187	106	65.05	55.532	4	20.55
20.4	30.982	48	43.36	62.487	63	72.70	41.034	153	67.48	55.511	21	20.44
					93			193			41	
30.4	30.934		43.66	62.424		73.72	40.841		69.61	55.470		20.19
June 9.3	30.864	70	43.77	62.337	87	74.36	40.615	226	71.37	55.411	59	19.85
19.3	30.778	86	43.68	62.228	109	74.71	40.362	253	72.72	55.333	78	19.41
29.3	30.676	102	43.39	62.101	127	74.78	40.091	271	73.62	55.242	91	18.89
July 9.3	30.561	115	42.94	61.958	143	74.54	39.809	282	74.04	55.139	103	18.30
		122			152			287			112	
19.2	30.439		42.30	61.806		74.03	39.522		73.98	55.027		17.66
29.2	30.312	127	41.52	61.649	157	73.22	39.237	285	73.45	54.910	117	16.98
Aug. 8.2	30.186	126	40.61	61.492	157	72.15	38.961	276	72.43	54.794	116	16.29
18.1	30.068	118	39.60	61.344	148	70.88	38.704	257	70.97	54.682	112	15.60
28.1	29.961	107	38.53	61.211	133	69.42	38.471	233	69.07	54.581	101	14.96
		86			107			200			83	
Sept. 7.1	29.875	58	37.43	61.104	74	67.84	38.271	159	66.77	54.498	59	14.39
17.1	29.817	23	36.37	61.030	35	66.18	38.112	111	64.10	54.439	27	13.92
27.0	29.794	17	35.40	60.995	13	64.56	38.001	54	61.13	54.412	10	13.60
Oct. 7.0	29.811	63	34.56	61.008	66	63.00	37.947	9	57.90	54.422	32	13.47
17.0	29.874	112	33.94	61.074	122	61.60	37.956	75	54.48	54.474	98	13.56
27.0	29.986		33.58	61.196		60.44	38.031		50.91	54.572		13.91
Nov. 5.9	30.147	161	33.49	61.375	179	59.59	38.178	147	47.31	54.717	145	14.53
15.9	30.359	212	33.75	61.610	235	59.08	38.394	216	43.74	54.909	192	15.43
25.9	30.616	257	34.35	61.895	285	58.97	38.680	296	40.31	55.143	234	16.62
Dec. 5.8	30.911	325	35.28	62.223	361	59.29	39.027	347	37.10	55.417	274	18.06
								400			304	
15.8	31.236		36.54	62.584		60.02	39.427		34.22	55.721		19.72
25.8	31.580	344	38.09	62.967	383	61.16	39.869	442	31.76	56.045	324	21.55
35.8	31.936	356	39.87	63.359	392	62.65	40.338	460	29.79	56.380	335	23.50
Mean Place	27.594		21.25	58.828		48.45	37.671		71.83	52.247		1.04
Sec δ , Tan δ	1.084		-0.419	1.240		-0.734	1.759		+1.447	1.018		-0.190
$D\psi\alpha$, $D\omega\alpha$	+0.06		-0.03	+0.07		-0.05	+0.05		+0.09	+0.06		-0.01
$D\psi\delta$, $D\omega\delta$	-0.4		-0.3	-0.4		-0.3	-0.4		-0.3	-0.4		-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	Groombridge 3001. Mag. 6.1			70 Virginis. Mag. 5.2			ζ Virginis. Mag. 3.4			17 H. Canum. Venet. Mag. 5.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 13 23	° ' " s	+72 48	h m 13 24	° ' " s	+14 12	h m 13 30	° ' " s	- 0 10	h m 13 31	° ' " s	+37 35
Jan. 0.8	62.00	81	35.13	25.913	132	46.14	31.564	205	45.02	8.788	198	48.38
10.8	62.81	81	33.81	26.248	335	44.05	31.895	331	47.07	9.164	376	46.40
20.7	63.63	82	33.14	26.579	331	42.21	32.222	327	49.03	9.541	377	44.89
30.7	64.44	81	33.14	26.896	0	40.69	32.536	314	50.81	9.906	365	43.90
Feb. 9.7	65.20	76	33.81	27.190	294	39.54	32.828	292	52.36	10.248	342	43.48
	66	128		285		76	284		129	310		11
19.6	65.89	59	35.09	27.455	38	38.78	33.092	233	53.65	10.558	271	43.59
Mar. 1.6	66.48	59	36.95	27.687	232	38.40	33.325	233	54.67	10.829	271	44.23
11.6	66.95	47	39.28	27.882	195	38.39	33.522	197	55.38	11.056	227	45.34
21.6	67.31	36	42.00	28.038	156	38.74	33.683	161	55.82	11.237	181	46.87
31.5	67.53	22	44.98	28.156	118	39.38	33.810	127	55.98	11.370	133	48.73
	8	311		83		89	93		6	87		211
Apr. 10.5	67.61	5	48.09	28.239	50	40.27	33.903	63	55.92	11.457	44	50.84
20.5	67.56	17	51.21	28.289	19	41.35	33.966	34	55.64	11.501	3	53.09
30.5	67.39	28	54.23	28.308	8	42.56	34.000	8	55.21	11.504	3	55.40
May 10.4	67.11	38	57.06	28.300	3	43.83	34.008	17	54.65	11.470	34	57.67
20.4	66.73	48	59.58	28.267	33	45.12	33.991	37	53.99	11.403	67	59.83
			215	53		126			72	95		198
30.4	66.25	54	61.73	28.214	74	46.38	33.954	57	53.27	11.308	120	61.81
June 9.3	65.71	59	63.44	28.140	89	47.54	33.897	75	52.52	11.188	140	63.53
19.3	65.12	63	64.65	28.051	103	48.59	33.822	89	51.78	11.048	157	64.98
29.3	64.49	64	65.36	27.948	113	49.51	33.733	102	51.04	10.891	170	66.07
July 9.3	63.85	66	65.52	27.835	121	50.24	33.631	112	50.34	10.721	176	66.82
			38			56			63			36
19.2	63.19	64	65.14	27.714	125	50.79	33.519	116	49.71	10.545	180	67.18
29.2	62.55	62	64.24	27.589	124	51.14	33.403	119	49.14	10.365	177	67.15
Aug. 8.2	61.93	58	62.81	27.465	118	51.26	33.284	113	48.65	10.188	170	66.73
18.2	61.35	53	60.92	27.347	109	51.17	33.171	106	48.27	10.018	155	65.91
28.1	60.82	44	58.57	27.238	91	50.83	33.065	90	48.03	9.863	136	64.71
			275			59			11			156
Sept. 7.1	60.38	38	55.82	27.147	68	50.24	32.975	66	47.92	9.727	107	63.15
17.1	60.00	29	52.72	27.079	3	49.40	32.909	38	47.99	9.620	73	61.25
27.0	59.71	18	49.33	27.041	3	48.30	32.871	4	48.26	9.547	33	59.02
Oct. 7.0	59.53	6	45.72	27.038	38	46.94	32.867	38	48.75	9.514	15	56.50
17.0	59.47	7	41.96	27.076	83	45.35	32.905	83	49.47	9.529	66	53.74
			384			183			97			206
27.0	59.54	18	33.12	27.159	129	43.52	32.988	129	50.44	9.595	119	50.78
Nov. 5.9	59.72	31	34.31	27.288	176	41.46	33.117	175	51.67	9.714	176	47.67
15.9	60.03	43	30.61	27.464	220	39.23	33.292	220	53.13	9.890	227	44.50
25.9	60.46	56	27.13	27.684	260	36.87	33.512	258	54.82	10.117	276	41.34
Dec. 5.9	61.02	65	23.96	27.944	291	34.44	33.770	289	56.68	10.393	316	38.28
			277			243			199			288
15.8	61.67	73	21.19	28.235	316	32.01	34.059	313	58.67	10.709	347	35.40
25.8	62.40	78	18.92	28.551	329	29.64	34.372	324	60.74	11.056	367	32.81
35.8	63.18		17.21	28.880		27.44	34.696		62.81	11.423		30.57
Mean Place	62.440		61.17	25.161		58.94	30.789		37.23	8.254		68.06
Sec δ, Tan δ	3.384		+3.233	1.031		+0.253	1.000		-0.003	1.262		+0.770
Dψ α, Dω α	+0.03		+0.20	+0.06		+0.02	+0.06		0.00	+0.05		+0.05
Dψ δ, Dω δ	-0.4		-0.4	-0.4		-0.4	-0.4		-0.4	-0.4		-0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.		ε Centauri. Mag. 2.6		m Virginia. Mag. 5.2		τ Bootis. Mag. 4.5		γ Ursa Majoris. (Albid.) Mag. 1.9	
		Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
		h m 13 34	° ' -53 2	h m 13 37	° ' - 8 17	h m 13 43	° ' +17 51	h m 13 44	° ' +49 42
		s 13 34	" "	s 13 37	" "	s 13 43	" "	s 13 44	" "
Jan.	0.8	41.712	51.70	19.107	27.69	22.531	40.13	18.928	57.45
	10.8	42.214	52.87	19.443	29.66	22.865	38.01	19.354	55.49
	20.7	42.709	54.48	19.776	31.61	23.199	36.16	19.786	54.08
	30.7	43.185	56.47	20.096	33.49	23.523	34.67	20.212	53.27
Feb.	9.7	43.629	58.77	20.394	35.24	23.827	33.59	20.615	53.07
	19.7	44.033	61.33	20.667	36.79	24.106	32.92	20.986	53.50
Mar.	1.6	44.391	64.06	20.907	38.14	24.353	32.67	21.313	54.49
	11.6	44.700	66.90	21.113	39.25	24.564	32.84	21.590	56.02
	21.6	44.956	69.79	21.285	40.12	24.738	33.37	21.812	57.98
	31.5	45.160	72.67	21.423	40.74	24.876	34.23	21.976	60.29
Apr.	10.5	45.312	75.48	21.527	41.16	24.976	35.37	22.083	62.87
	20.5	45.413	78.17	21.599	41.36	25.043	36.69	22.133	65.57
	30.5	45.465	80.69	21.644	41.39	25.077	38.15	22.131	68.32
May	10.4	45.471	83.00	21.661	41.27	25.083	39.67	22.079	71.00
	20.4	45.432	85.05	21.655	41.01	25.061	41.20	21.985	73.53
	30.4	45.351	86.81	21.625	40.65	25.016	42.68	21.851	75.82
June	9.4	45.231	88.24	21.575	40.20	24.948	44.07	21.684	77.79
	19.3	45.076	89.31	21.505	39.69	24.863	45.30	21.488	79.40
	29.3	44.890	89.99	21.420	39.12	24.760	46.36	21.270	80.62
July	9.3	44.678	90.27	21.321	38.51	24.642	47.23	21.036	81.40
	19.2	44.448	90.13	21.210	37.88	24.515	47.86	20.791	81.72
	29.2	44.206	89.59	21.091	37.25	24.381	48.26	20.541	81.58
Aug.	8.2	43.963	88.66	20.971	36.63	24.244	48.39	20.292	80.97
	18.2	43.730	87.35	20.854	36.03	24.111	48.27	20.053	79.91
	28.1	43.516	85.72	20.744	35.50	23.985	47.88	19.830	78.41
Sept.	7.1	43.334	83.80	20.649	35.05	23.876	47.21	19.632	76.51
	17.1	43.193	81.68	20.577	34.71	23.786	46.27	19.466	74.21
	27.1	43.106	79.44	20.534	34.54	23.726	45.05	19.340	71.57
Oct.	7.0	43.082	77.15	20.526	34.54	23.701	43.56	19.261	68.62
	17.0	43.129	74.93	20.560	34.76	23.716	41.80	19.238	65.43
	27.0	43.250	72.87	20.640	35.22	23.776	39.81	19.275	62.06
Nov.	5.9	43.448	71.04	20.767	35.95	23.884	37.60	19.376	58.56
	15.9	43.721	69.56	20.942	36.93	24.041	35.22	19.543	55.05
	25.9	44.060	68.48	21.122	38.19	24.244	32.72	19.774	51.58
Dec.	5.9	44.458	67.86	21.462	39.67	24.490	30.16	20.063	48.27
	15.8	44.903	67.73	21.714	41.36	24.770	27.63	20.403	45.22
	25.8	45.380	68.10	22.030	43.19	25.079	25.18	20.787	42.52
	35.8	45.875	68.97	22.359	45.12	25.404	22.91	21.200	40.25
Mean Place		40.910	60.30	18.346	22.79	21.922	53.77	18.709	79.54
Sec δ, Tan δ		1.664	-1.330	1.011	-0.146	1.050	+0.322	1.547	+1.180
D δ α , D ω α		+0.08	-0.08	+0.06	-0.01	+0.06	+0.02	+0.05	+0.07
D δ δ , D ω δ		-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	39 Virginis. Mag. 5.1			5 Centauri. Mag. 3.1			7 Boötis. Mag. 2.8			θ Apodis. Var. 5.5-6.6		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 13 45	s 45	° ' 17 43	h m 13 50	s 50	° ' 46 53	h m 13 50	s 50	° ' +18 47	h m 13 57	s 57	° ' -76 23
n. 0.8	25.481		35.76	25.664		0.18	47.379		76.11	17.58		54.02
10.8	25.828	347	37.56 180	26.116	452	1.31 113	47.713	334	73.94 217	18.71	113	54.25 23
20.7	26.173	345	39.45 189	26.567	451	2.82 151	48.048	335	72.06 188	19.85	114	55.07 82
30.7	26.506	333	41.37 192	27.003	436	4.66 184	48.375	327	70.55 151	20.96	111	56.45 138
sb. 9.7	26.817	311	43.26 189	27.414	411	6.78 212	48.684	309	69.45 110	22.02	106	58.31 186
		287	181		379	332		284			98	230
19.7	27.104		45.07	27.793		9.10	48.968		68.78	23.00		60.61
ar. 1.6	27.358	254	46.74 167	28.133	340	11.57 247	49.221	253	68.54 24	23.90	90	63.29 268
11.6	27.579	221	48.26 152	28.431	298	14.14 257	49.440	219	68.72 18	24.68	78	66.27 298
21.6	27.766	187	49.61 135	28.684	253	16.72 258	49.623	183	69.29 57	25.35	67	69.49 322
31.6	27.917	151	50.75 114	28.891	207	19.27 255	49.768	145	70.18 80	25.90	55	72.83 334
		118	96		163	248		109	118		41	345
pr. 10.5	28.035		51.71	29.054		21.75	49.877		71.36	26.31		76.28
20.5	28.122	87	52.47 76	29.173	119	24.13 238	49.952	76	72.73 137	26.58	27	79.73 345
30.5	28.179	57	53.05 58	29.249	76	26.35 222	49.994	42	74.24 151	26.73	15	83.09 336
ay 10.4	28.206	7	53.47 42	29.283	34	28.37 202	50.006	12	75.83 159	26.74	1	86.35 326
20.4	28.210	23	53.71 10	29.278	42	30.18 181	49.990	16	77.42 150	26.61	13	89.38 303
						154		39	154		25	278
30.4	28.187		53.81	29.236		31.72	49.951		78.96	26.36		92.16
me 9.4	28.142	45	53.77 40	29.156	80	32.98 126	49.887	64	80.39 143	25.99	37	94.58 242
19.3	28.075	67	53.57 31	29.043	113	33.94 96	49.804	83	81.68 129	25.51	48	96.63 205
29.3	27.989	86	53.26 31	28.901	142	34.55 61	49.703	101	82.78 110	24.93	58	98.23 160
ly 9.3	27.887	102	52.83 43	28.733	168	34.81 26	49.585	118	83.68 90	24.28	65	99.36 113
		116	55		188	10		127	66		71	59
19.3	27.771		52.28	28.545		34.71	49.458		84.34	23.57		99.95
29.2	27.646	125	51.64 64	28.343	202	34.26 45	49.322	136	84.75 41	22.82	75	100.02 7
ug. 8.2	27.517	129	50.91 73	28.135	208	33.46 80	49.182	140	84.90 15	22.06	76	99.56 46
18.2	27.389	128	50.13 78	27.930	205	32.33 113	49.044	138	84.77 13	21.32	74	98.55 101
28.1	27.268	121	49.31 82	27.737	193	30.91 142	48.914	130	84.37 40	20.63	69	97.06 149
		105	81		168	167		116	69		62	196
pt. 7.1	27.163		48.50	27.569		29.24	48.798		83.68	20.01		95.10
17.1	27.081	82	47.74 76	27.434	135	27.39 185	48.702	96	82.71 97	19.50	51	92.77 233
27.1	27.029	52	47.07 67	27.344	90	25.43 196	48.635	67	81.45 126	19.13	37	90.12 265
st. 7.0	27.016	13	46.53 54	27.307	37	23.43 200	48.602	33	79.92 153	18.91	22	87.27 285
17.0	27.043	27	46.17 36	27.330	23	21.49 194	48.609	7	78.12 180	18.86	5	84.30 297
		77	13		91	181		53	205		14	296
27.0	27.120		46.04	27.421		19.68	48.662		76.07	19.00		81.34
rv. 6.0	27.246	126	46.17 13	27.580	159	18.11 157	48.762	100	73.82 225	19.32	32	78.51 283
15.9	27.423	177	46.58 41	27.806	226	16.85 126	48.912	150	71.39 243	19.82	50	75.93 258
25.9	27.646	223	47.30 72	28.096	290	15.94 91	49.109	197	68.83 256	20.50	68	73.71 222
sc. 5.9	27.912	266	48.29 99	28.441	345	15.45 49	49.349	240	66.23 260	21.32	82	71.91 180
		300	128		390	3		277	258		95	127
15.8	28.212		49.57	28.831		15.42	49.626		63.65	22.27		70.64
25.8	28.536	324	51.08 151	29.255	424	15.83 41	49.932	306	61.16 249	23.31	104	69.92 72
35.8	28.875	339	52.78 170	29.698	443	16.68 85	50.256	324	58.84 232	24.41	110	69.78 14
Place	24.741		34.12	24.950		7.22	46.825		99.86	17.447		66.33
Tan δ	1.050		-0.320	1.463		-1.068	1.056		+0.341	4.254		-4.135
D _α	+0.06		-0.02	+0.07		-0.06	+0.06		+0.02	+0.11		-0.24
D _δ	-0.4		-0.4	-0.4		-0.5	-0.4		-0.5	-0.3		-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	11 Boötis. Mag. 6.1		7 Virginis. Mag. 4.3		β Centauri. Mag. 0.9		π Hydræ. Mag. 3.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 13 57	° ' " +27 46	h m 13 57	° ' " +1 56	h m 13 58	° ' " -59 58	h m 14 1	° ' " -26 17
	s	"	s	"	s	"	s	"
Jan. 0.8	27.881	39.31	28.932	18.95	2.020	31.13	42.522	15.42
10.8	28.224 ³⁴³	37.11 ²²⁰	29.258 ³²⁶	16.90 ²⁰⁵	2.604 ⁵⁸⁴	31.81 ⁶⁸	42.884 ³⁶²	16.94 ¹⁵²
20.7	28.572 ³⁴⁸	35.29 ¹⁸²	29.586 ³²⁸	14.97 ¹⁹³	3.188 ⁵⁸⁴	32.98 ¹¹⁷	43.248 ³⁶⁴	18.65 ¹⁷¹
30.7	28.914 ³⁴²	33.91 ¹³⁸	29.906 ³²⁰	13.24 ¹⁷³	3.758 ⁵⁷⁰	34.59 ¹⁶¹	43.601 ³⁵³	20.49 ¹⁵⁴
Feb. 9.7	29.239 ³²⁵	33.02 ⁸⁹	30.208 ³⁰²	11.74 ¹⁵⁰	4.300 ⁵⁴²	36.59 ²⁰⁰	43.937 ³³⁶	22.39 ¹⁹⁰
	300	40	280	121	501	232	310	191
19.7	29.539	32.62	30.488	10.53	4.801	38.91	44.247	24.30
Mar. 1.6	29.808 ²⁶⁹	32.72 ¹⁰	30.738 ²⁵⁰	9.61 ⁹²	5.256 ⁴⁵⁵	41.51 ²⁶⁰	44.529 ²⁸²	26.18 ¹⁵⁸
11.6	30.042 ²³⁴	33.29 ⁵⁷	30.957 ²¹⁹	9.01 ⁶⁰	5.657 ⁴⁰¹	44.29 ²⁷⁸	44.777 ²⁴⁸	27.98 ¹⁸⁰
21.6	30.237 ¹⁹⁵	34.29 ¹⁰⁰	31.144 ¹⁸⁷	8.71 ³⁰	6.000 ³⁴³	47.20 ²⁹¹	44.989 ²¹²	29.66 ¹⁶⁸
31.6	30.392 ¹⁵⁵	35.64 ¹³⁵	31.296 ¹⁵²	8.69 ²	6.283 ²⁸³	50.17 ²⁹⁷	45.167 ¹⁷⁸	31.21 ¹⁵⁵
	116	165	119	24	222	298	145	140
Apr. 10.5	30.508	37.29	31.415	8.93	6.505	53.15	45.312	32.61
20.5	30.586 ⁷⁸	39.14 ¹⁸⁵	31.505 ⁹⁰	9.37 ⁴⁴	6.667 ¹⁶²	56.07 ²⁹²	45.422 ¹¹⁰	33.84 ¹²³
30.5	30.629 ⁴³	41.11 ¹⁹⁷	31.564 ⁵¹	9.98 ⁶¹	6.769 ¹⁰²	58.89 ²⁸²	45.500 ⁷⁸	34.91 ¹⁰⁷
May 10.4	30.637 ⁸	43.13 ²⁰²	31.595 ³⁹	10.72 ⁷⁴	6.810 ⁴¹	61.52 ²⁶³	45.549 ⁴⁹	35.81 ⁹⁰
20.4	30.615 ²²	45.12 ¹⁹⁹	31.602 ⁷	11.54 ⁸²	6.794 ¹⁶	63.96 ²⁴⁴	45.567 ¹⁸	36.53 ⁷²
	50	189	19	87	72	215	9	55
30.4	30.565	47.01	31.583	12.41	6.722	66.11	45.558	37.08
June 9.4	30.489 ⁷⁶	48.74 ¹⁷³	31.542 ⁴¹	13.29 ⁸⁸	6.597 ¹²⁵	67.97 ¹⁸⁶	45.521 ³⁷	37.44 ³⁶
19.3	30.391 ⁹⁸	50.26 ¹⁵²	31.480 ⁶²	14.15 ⁸⁶	6.423 ¹⁷⁴	69.46 ¹⁴⁹	45.459 ⁶²	37.62 ¹⁸
29.3	30.273 ¹¹⁸	51.52 ¹²⁶	31.400 ⁸⁰	14.97 ⁸²	6.204 ²¹⁹	70.57 ¹¹¹	45.374 ⁸⁵	37.61 ¹
July 9.3	30.139 ¹³⁴	52.51 ⁹⁹	31.304 ⁹⁶	15.74 ⁷⁷	5.948 ²⁵⁶	71.25 ⁶⁸	45.269 ¹⁰⁵	37.41 ²⁰
	147	68	110	67	284	25	123	36
19.3	29.992	53.19	31.194	16.41	5.664	71.50	45.146	37.05
29.2	29.837 ¹⁵⁵	53.54 ³⁵	31.073 ¹²¹	16.99 ⁵⁸	5.358 ³⁰⁶	71.30 ²⁰	45.010 ¹³⁶	36.51 ⁵⁴
Aug. 8.2	29.677 ¹⁶⁰	53.56 ²	30.947 ¹²⁶	17.47 ⁴⁸	5.044 ³¹⁴	70.64 ⁶⁶	44.866 ¹⁴⁴	35.79 ⁷²
18.2	29.519 ¹⁵⁸	53.24 ³²	30.821 ¹²⁸	17.81 ³⁴	4.736 ³⁰⁸	69.55 ¹⁰⁹	44.722 ¹⁴⁴	34.94 ⁸⁵
28.1	29.369 ¹⁵⁰	52.57 ⁶⁷	30.701 ¹²⁰	18.00 ¹⁹	4.444 ²⁹²	68.07 ¹⁴⁸	44.583 ¹³⁹	33.98 ⁹⁶
	137	100	109	3	259	182	125	104
Sept. 7.1	29.232	51.57	30.592	18.03	4.185	66.25	44.458	32.94
17.1	29.118 ¹¹⁴	50.23 ¹³⁴	30.503 ⁸⁹	17.89 ¹⁴	3.972 ²¹³	64.12 ²¹³	44.355 ¹⁰³	31.86 ¹⁰⁸
27.1	29.033 ⁸⁵	48.57 ¹⁶⁶	30.441 ⁶²	17.53 ³⁶	3.820 ¹⁵²	61.79 ²³³	44.284 ⁷¹	30.80 ¹⁰⁶
Oct. 7.0	28.982 ⁵¹	46.62 ¹⁹⁵	30.412 ²⁹	16.95 ⁵⁸	3.741 ⁷⁹	59.34 ²⁴⁵	44.252 ³²	29.81 ⁹⁹
17.0	28.974 ⁸	44.38 ²²⁴	30.423 ¹¹	16.14 ⁸¹	3.745 ⁴	56.85 ²⁴⁹	44.264 ¹²	28.95 ⁸⁶
	39	248	54	106	92	241	64	67
27.0	29.013	41.90	30.477	15.08	3.837	54.44	44.328	28.28
Nov. 6.0	29.102 ⁸⁹	39.22 ²⁶⁸	30.579 ¹⁰²	13.79 ¹²⁹	4.021 ¹⁸⁴	52.22 ²²²	44.445 ¹¹⁷	27.83 ⁴⁵
15.9	29.244 ¹⁴²	36.41 ²⁸¹	30.729 ¹⁵⁰	12.26 ¹⁵³	4.296 ²⁷⁵	50.26 ¹⁹⁶	44.616 ¹⁷¹	27.67 ¹⁶
25.9	29.436 ¹⁹²	33.51 ²⁹⁰	30.925 ¹⁹⁶	10.52 ¹⁷⁴	4.653 ³⁵⁷	48.67 ¹⁵⁹	44.838 ²²²	27.84 ¹⁷
Dec. 5.9	29.674 ²³⁸	30.61 ²⁹⁰	31.162 ²³⁷	8.62 ¹⁹⁰	5.087 ⁴³⁴	47.51 ¹¹⁶	45.106 ²⁶⁸	28.31 ⁴⁷
	278	282	273	202	495	68	307	80
15.8	29.952	27.79	31.435	6.60	5.582	46.83	45.413	29.11
25.8	30.263 ³¹¹	25.15 ²⁶⁴	31.736 ³⁰¹	4.52 ²⁰⁸	6.123 ⁵⁴¹	46.67 ¹⁶	45.749 ³³⁶	30.21 ¹¹⁰
35.8	30.595 ³³²	22.75 ²⁴⁰	32.053 ³¹⁷	2.44 ²⁰⁸	6.693 ⁵⁷⁰	47.02 ³⁵	46.103 ³⁵⁴	31.57 ¹³⁶
Mean Place	27.450	55.50	28.319	27.06	1.440	41.00	41.854	16.61
Sec δ, Tan δ	1.130	+0.527	1.001	+0.034	1.999	-1.731	1.115	-0.494
Dψ α, Dω α	+0.05	+0.03	+0.06	0.00	+0.08	-0.10	+0.07	-0.03
Dψ δ, Dω δ	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	θ Centauri. Mag. 2.3		α Draconis. Mag. 3.6		δ Boötis. Mag. 4.8		κ Virginis. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 1	° ' " -35 57	h m 14 2	° ' " +64 45	h m 14 6	° ' " +25 28	h m 14 8	° ' " - 9 53
n.	0.8	51.705	57.56	9.57	38.97	39.991	30.85	31.751
	10.8	52.098	58.86	10.14	37.02	40.327	28.61	32.083
	20.8	52.492	60.44	10.73	35.70	40.670	26.71	32.417
	30.7	52.875	62.24	11.32	35.02	41.008	25.24	32.745
ab.	9.7	53.239	64.22	11.90	35.01	41.332	24.24	33.056
	19.7	53.576	66.31	12.44	35.68	41.632	23.72	33.346
ar.	1.6	53.880	68.45	12.92	36.95	41.904	23.69	33.609
	11.6	54.149	70.60	13.33	38.79	42.142	24.12	33.842
	21.6	54.381	72.70	13.67	41.10	42.342	24.98	34.042
	31.6	54.575	74.73	13.91	43.78	42.505	26.21	34.211
pr.	10.5	54.732	76.66	14.08	46.72	42.631	27.73	34.348
	20.5	54.851	78.46	14.15	49.80	42.719	29.48	34.454
	30.5	54.934	80.00	14.14	52.90	42.774	31.37	34.530
ay	10.5	54.984	81.55	14.04	55.91	42.794	33.32	34.579
	20.4	55.000	82.82	13.88	58.74	42.784	35.26	34.601
	30.4	54.984	83.87	13.63	61.28	42.746	37.13	34.597
ine	9.4	54.936	84.71	13.34	63.48	42.681	38.86	34.569
	19.3	54.861	85.29	12.99	65.25	42.594	40.39	34.518
	29.3	54.760	85.62	12.61	66.58	42.485	41.70	34.445
ily	9.3	54.633	85.69	12.20	67.40	42.359	42.73	34.353
	19.3	54.489	85.49	11.77	67.71	42.218	43.48	34.246
	29.2	54.328	85.04	11.33	67.50	42.067	43.93	34.125
ug.	8.2	54.161	84.32	10.89	66.77	41.911	44.05	33.997
	18.2	53.993	83.38	10.46	65.53	41.754	43.84	33.866
	28.2	53.833	82.23	10.06	63.82	41.602	43.31	33.739
pt.	7.1	53.688	80.92	9.69	61.65	41.464	42.44	33.625
	17.1	53.570	79.49	9.36	59.06	41.345	41.25	33.527
	27.1	53.487	78.01	9.10	56.11	41.253	39.73	33.458
st.	7.0	53.447	76.55	8.91	52.86	41.197	37.93	33.421
	17.0	53.458	75.16	8.79	49.34	41.181	35.83	33.426
	27.0	53.525	73.95	8.75	45.67	41.211	33.49	33.475
ov.	6.0	53.651	72.94	8.81	41.90	41.291	30.93	33.573
	15.9	53.837	72.23	8.96	38.12	41.422	28.21	33.720
	25.9	54.078	71.85	9.22	34.44	41.604	25.39	33.915
sc.	5.9	54.369	71.83	9.56	30.97	41.832	22.55	34.152
	15.9	54.700	72.19	9.97	27.79	42.101	19.76	34.428
	25.8	55.064	72.92	10.46	25.02	42.404	17.12	34.732
	35.8	55.446	73.98	11.00	22.72	42.728	14.70	35.053
a Place	51.039	61.64	10.178	62.76	39.601	46.16	31.152	33.43
ß, Tan δ	1.235	-0.726	2.346	+2.121	1.108	+0.476	1.015	-0.174
, $D_{\omega} \alpha$	+0.07	-0.04	+0.03	+0.12	+0.05	+0.03	+0.06	-0.01
, $D_{\omega} \delta$	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	4 Ursæ Minoris. Mag. 5.0			2 Virginis. Mag. 4.2			α Boëtis. (Arcturus.) Mag. 0.2			λ Boëtis. Mag. 4.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	"	h m	s	"	h m	s	"	h m	s	"
	14 9		+77 55	14 11		- 5 36	14 11		+19 36	14 13		+46 27
Jan. 0.8	6.09		33.43	43.301		40.46	55.647		18.14	16.086		31.37
10.8	7.11	102	31.65	43.629	328	42.38	55.973	326	15.85	16.479	393	29.12
20.8	8.19	108	30.50	43.959	330	44.25	56.305	332	13.86	16.885	406	27.38
30.7	9.29	110	30.02	44.284	325	46.03	56.632	327	12.24	17.292	407	26.21
Feb. 9.7	10.38	109	30.22	44.592	308	47.65	56.947	315	11.03	17.684	392	25.65
		102			289			292			369	
19.7	11.40		31.08	44.881		49.07	57.239		10.26	18.053		25.72
Mar. 1.6	12.33	93	32.57	45.142	261	50.24	57.504	265	9.94	18.388	335	26.37
11.6	13.14	81	34.60	45.375	233	51.18	57.738	234	10.05	18.681	293	27.58
21.6	13.77	63	37.10	45.575	200	51.85	57.936	198	10.56	18.926	245	29.28
31.6	14.24	47	39.94	45.744	169	52.28	58.100	164	11.45	19.121	195	31.39
		29			138			128			144	
Apr. 10.5	14.53	10	43.02	45.882	106	52.47	58.228	94	12.62	19.265	91	33.81
20.5	14.63	8	46.22	45.988	77	52.46	58.322	61	14.02	19.356	42	36.44
30.5	14.55	8	49.41	46.065	50	52.27	58.383	29	15.58	19.398	5	39.18
May 10.5	14.28	27	52.48	46.115	50	51.94	58.412	2	17.23	19.393	48	41.91
20.4	13.86	58	55.34	46.137	2	51.51	58.414	27	18.90	19.345	89	44.55
30.4	13.28	70	57.88	46.135	50.99	58.387	20.51	19.256	47.02			
June 9.4	12.58	81	60.05	46.107	28	50.41	58.335	52	22.03	19.131	125	49.23
19.3	11.77	89	61.76	46.058	61	49.80	58.258	77	23.42	18.973	158	51.13
29.3	10.88	96	62.99	45.986	72	49.17	58.162	96	24.60	18.789	184	52.67
July 9.3	9.92	99	63.69	45.896	107	48.53	58.046	130	25.59	18.581	208	53.79
19.3	8.93	100	63.86	45.789	120	47.91	57.916	141	26.32	18.357	236	54.49
29.2	7.93	101	63.49	45.669	127	46.77	57.775	149	26.80	18.121	241	54.73
Aug. 8.2	6.92	97	62.59	45.542	131	46.27	57.626	150	27.00	17.880	240	54.53
18.2	5.95	92	61.15	45.411	127	45.86	57.476	146	26.93	17.640	230	53.86
28.2	5.03	85	59.25	45.284	116		57.330	135	26.55	17.410	213	52.75
Sept. 7.1	4.18	74	56.90	45.168	100	45.54	57.195	116	25.88	17.197	188	51.21
17.1	3.44	63	54.15	45.068	72	45.36	57.079	91	24.92	17.009	153	49.26
27.1	2.81	50	51.03	44.996	40	45.33	56.988	57	23.65	16.856	111	46.94
Oct. 7.0	2.31	36	47.63	44.956	1	45.48	56.931	18	22.09	16.745	60	44.28
17.0	1.95	17	44.01	44.955	45	45.83	56.913	27	20.27	16.685	5	41.32
27.0	1.78	1	40.25	45.000	91	46.40	56.940	75	18.18	16.680	58	38.12
Nov. 6.0	1.77	18	36.42	45.091	142	47.23	57.015	125	15.88	16.738	120	34.75
15.9	1.95	36	32.63	45.233	187	48.30	57.140	175	13.38	16.858	183	31.29
25.9	2.31	54	28.96	45.420	232	49.60	57.315	220	10.75	17.041	243	27.82
Dec. 5.9	2.85	71	25.54	45.652	269	51.11	57.535	260	8.06	17.284	298	24.44
15.9	3.56	85	22.45	45.921	298	52.81	57.795	291	5.37	17.582	342	21.24
25.8	4.41	96	19.80	46.219	317	54.62	58.086	315	2.79	17.924	375	18.33
35.8	5.37		17.65	46.536		56.51	58.401		0.36	18.299		15.81
Mean Place	8.773		57.96	42.735		35.07	55.236		31.57	16.088		51.66
Sec δ , Tan δ	4.781		+4.676	1.005		-0.098	1.062		+0.356	1.452		+1.052
$D\phi \alpha$, $D\omega \alpha$	-0.01		+0.26	+0.06		-0.01	+0.06		+0.02	+0.05		+0.06
$D\phi \delta$, $D\omega \delta$	-0.3		-0.5	-0.3		-0.5	-0.3		-0.5	-0.3		-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington on Time.	λ Virginis. Mag. 4.6		β Libræ. Mag. 6.3		θ Boötis. Mag. 4.1		γ Boötis. Mag. 5.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 14	° ' " -12 59	h m 14 19	° ' " -11 20	h m 14 22	° ' " +52 13	h m 14 22	° ' " +19 35
n. 0.8	40.728	42.32	1.250	27.87	24.106	24.52	38.837	28.75
10.8	41.063 ³³⁵	44.06 ¹⁷⁴	1.581 ³³¹	29.62 ¹⁷⁵	24.525 ⁴¹⁹	22.22 ²³⁰	39.161 ³²⁴	26.48 ²²⁷
20.8	41.401 ³³⁸	45.84 ¹⁷⁸	1.917 ³³⁶	31.41 ¹⁷⁹	24.963 ⁴³⁸	20.45 ¹⁷⁷	39.492 ³³¹	24.52 ¹⁹⁶
30.7	41.733 ³³²	47.61 ¹⁷⁷	2.247 ³³⁰	33.16 ¹⁷⁵	25.405 ⁴⁴²	19.28 ¹³³	39.822 ³³⁰	22.91 ¹⁶¹
b. 9.7	42.061 ³¹⁸	49.29 ¹⁶⁸	2.562 ³¹⁵	34.81 ¹⁶⁵	25.838 ⁴³³	18.75 ⁵³	40.141 ³¹⁹	21.71 ¹²⁰
	295	157	298	152	408	10	298	76
19.7	42.346	50.86	2.860	36.33	26.246	18.85	40.439	20.95
ar. 1.7	42.615 ²⁶⁹	52.27 ¹⁴¹	3.130 ²⁷⁰	37.68 ¹³⁵	26.620 ³²⁹	19.58 ⁷³	40.713 ²⁷⁴	20.64 ³¹
11.6	42.856 ²⁴¹	53.48 ¹²¹	3.372 ²⁴²	38.81 ¹¹³	26.949 ³⁷⁴	20.89 ¹³¹	40.956 ²⁴³	20.78 ¹⁴
21.6	43.064 ²⁰⁸	54.50 ¹⁰²	3.583 ²¹¹	39.74 ⁹³	27.227 ²⁷⁸	22.71 ¹⁸²	41.166 ²¹⁰	21.33 ⁵⁵
31.6	43.240 ¹⁷⁶	55.30 ⁸⁰	3.763 ¹⁸⁰	40.44 ⁷⁰	27.449 ²²²	24.96 ²²⁵	41.341 ¹⁷⁵	22.24 ⁹¹
	145	60	148	50	165	257	142	128
or. 10.5	43.385	55.90	3.911	40.94	27.614	27.53	41.483	23.47
20.5	43.499 ¹¹⁴	56.32 ⁴²	4.028 ¹¹⁷	41.24 ³⁰	27.720 ¹⁰⁶	30.31 ²⁷⁸	41.589 ¹⁰⁶	24.93 ¹⁴⁶
30.5	43.584 ⁸⁵	56.55 ²³	4.116 ⁸⁸	41.38 ¹⁴	27.768 ⁴⁸	33.21 ²⁹⁰	41.662 ⁷³	26.57 ¹⁶⁴
ay 10.5	43.640 ⁵⁶	56.64 ⁹	4.175 ⁵⁹	41.37 ¹	27.781 ⁷	36.10 ²⁸⁹	41.703 ⁴³	28.30 ¹⁷³
20.4	43.668 ²⁸	56.60 ⁴	4.207 ³²	41.23 ¹⁴	27.703 ⁵⁸	38.90 ²⁸⁰	41.717 ¹²	30.07 ¹⁷⁷
	2	15	6	26	105	261	17	173
30.4	43.670	56.45	4.213	40.97	27.598	41.51	41.700	31.80
ne 9.4	43.646 ²⁴	56.18 ²⁷	4.192 ²¹	40.64 ³³	27.449 ¹⁴⁹	43.85 ²³⁴	41.658 ⁴²	33.43 ¹⁶³
19.4	43.599 ⁴⁷	55.84 ³⁴	4.148 ⁴⁴	40.23 ⁴¹	27.264 ¹⁸⁵	45.86 ²⁰¹	41.590 ⁶⁸	34.92 ¹⁴⁹
29.3	43.529 ⁷⁰	55.42 ⁴²	4.080 ⁶⁸	39.76 ⁴⁷	27.044 ²²⁰	47.48 ¹⁶²	41.500 ⁹⁰	36.24 ¹³²
ly 9.3	43.439 ¹⁰⁸	54.94 ⁵³	3.993 ⁸⁷	39.25 ⁵¹	26.799 ²⁴⁵	48.67 ¹¹⁹	41.390 ¹¹⁰	37.33 ¹⁰⁹
			106	55	267	73	128	86
19.3	43.331	54.41	3.887	38.70	26.532	49.40	41.264	38.19
29.2	43.209 ¹²²	53.83 ⁵⁸	3.765 ¹²²	38.12 ⁵⁸	26.252 ²⁸⁰	49.66 ²⁶	41.124 ¹⁴⁰	38.78 ⁵⁹
ig. 8.2	43.079 ¹³⁰	53.22 ⁶¹	3.636 ¹²⁹	37.53 ⁵⁹	25.964 ²⁸⁸	49.43 ²³	40.975 ¹⁴⁹	39.10 ³²
18.2	42.945 ¹³⁴	52.60 ⁶²	3.502 ¹³⁴	36.95 ⁵⁸	25.678 ²⁸⁶	48.72 ⁷¹	40.823 ¹⁵²	39.14 ⁴
28.2	42.814 ¹³¹	51.99 ⁶¹	3.370 ¹³²	36.39 ⁵⁶	25.400 ²⁷⁸	47.54 ¹¹⁸	40.674 ¹⁴⁹	38.87 ²⁷
	120	57	122	51	258	164	140	57
pt. 7.1	42.694	51.42	3.248	35.88	25.142	45.90	40.534	38.30
17.1	42.592 ¹⁰²	50.91 ⁵¹	3.143 ¹⁰⁶	35.44 ⁴⁴	24.910 ²³²	43.84 ²⁰⁶	40.412 ¹²²	37.44 ⁸⁶
27.1	42.516 ⁷⁶	50.50 ⁴¹	3.064 ⁷⁹	35.11 ³³	24.716 ¹⁹⁴	41.38 ²⁴⁶	40.313 ⁹⁹	36.27 ¹¹⁷
t. 7.1	42.474 ⁴²	50.23 ²⁷	3.017 ⁴⁷	34.94 ¹⁷	24.567 ¹⁴⁹	38.58 ²⁸⁰	40.247 ⁶⁶	34.82 ¹⁴⁵
17.0	42.472 ²	50.13 ¹⁰	3.011 ⁶	34.94 ⁰	24.474 ⁹³	35.46 ³¹²	40.220 ²⁷	33.08 ¹⁷⁴
	44	10	39	20	33	335	17	201
27.0	42.516	50.23	3.050	35.14	24.441	32.11	40.237	31.07
v. 6.0	42.610 ⁹⁴	50.58 ³⁵	3.138 ⁸⁸	35.59 ⁴⁵	24.476 ³⁵	28.58 ³⁵³	40.302 ⁶⁵	28.84 ²²³
15.9	42.754 ¹⁴⁴	51.19 ⁶¹	3.276 ¹³⁸	36.28 ⁶⁹	24.581 ¹⁰⁵	24.96 ³⁶²	40.418 ¹¹⁶	26.43 ²⁴¹
25.9	42.946 ¹⁹²	52.04 ⁸⁵	3.463 ¹⁸⁷	37.21 ⁹³	24.756 ¹⁷⁶	21.35 ³⁶¹	40.583 ¹⁶⁵	23.86 ²⁶⁷
c. 5.9	43.182 ²³⁶	53.14 ¹¹⁰	3.694 ²³¹	38.40 ¹¹⁹	24.999 ²⁴⁸	17.84 ³⁵¹	40.795 ²¹²	21.22 ²⁶⁴
	275	134	270	139	304	331	254	264
15.9	43.457	54.48	3.964	39.79	25.303	14.53	41.049	18.58
25.8	43.762 ³⁰⁵	56.00 ¹⁵²	4.264 ³⁰⁰	41.35 ¹⁵⁶	25.661 ³⁵⁸	11.53 ³⁰⁰	41.335 ²⁸⁶	16.03 ²⁵⁵
35.8	44.085 ³²³	57.67 ¹⁶⁷	4.584 ³²⁰	43.06 ¹⁷¹	26.059 ³⁹⁸	8.93 ²⁶⁰	41.646 ³¹¹	13.63 ²⁴⁰
Place	40.153	39.37	0.702	24.43	24.373	45.49	38.493	41.84
Tan δ	1.026	-0.231	1.020	-0.201	1.632	+1.290	1.062	+0.356
$D_{\alpha} \alpha$	+0.06	-0.01	+0.07	-0.01	+0.04	+0.07	+0.06	+0.02
$D_{\alpha} \delta$	-0.3	-0.6	-0.3	-0.6	-0.3	-0.8	-0.3	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϕ Virginis. Mag. 5.0			δ Ursæ Minoris. Mag. 4.4			ρ Boëtia. Mag. 3.8			γ Boëtia. Mag. 3.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	14 23		- 1 51	14 27		+76 2	14 28		+30 43	14 28		+38 39
Jan. 0.8	59.035		45.78	38.08		74.72	17.969		34.89	46.652		41.20
10.8	59.356	321	47.72 194	38.97	89	72.68 204	18.304	335	32.51 238	47.007	355	38.80 240
20.8	59.682	320	49.58 186	39.90	93	71.26 142	18.651	347	30.53 198	47.375	368	36.86 194
30.7	60.004	322	51.31 173	40.86	96	70.49 77	18.999	348	29.01 152	47.746	371	35.44 142
Feb. 9.7	60.314	310	52.85 154	41.82	96	70.41 8	19.338	339	27.99 102	48.108	362	34.57 87
		292			92			320			341	
19.7	60.606		54.14	42.74		71.00	19.658		27.50	48.449		34.28
Mar. 1.7	60.872	266	55.17 103	43.59	85	72.23 123	19.950	292	27.54 4	48.763	314	34.57 29
11.6	61.112	210	55.91 74	44.34	75	74.04 181	20.211	261	28.11 57	49.043	280	35.41 84
21.6	61.320	208	56.37 46	44.97	63	76.35 231	20.437	226	29.13 102	49.284	241	36.74 133
31.6	61.497	177	56.56 19	45.44	47	79.07 272	20.626	189	30.55 142	49.482	198	38.50 176
		148			33			149			155	
Apr. 10.6	61.645		56.51	45.77		82.08	20.775		32.32	49.637		40.60
20.5	61.760	115	56.24 27	45.94	17	85.25 317	20.886	111	34.32 200	49.749	112	42.94 234
30.5	61.848	88	55.79 45	45.94	0	88.48 323	20.959	73	36.51 219	49.818	69	45.43 249
May 10.5	61.906	58	55.21 58	45.80	14	91.64 316	20.995	36	33.75 224	49.845	27	47.99 256
20.4	61.937	31	54.52 69	45.51	29	94.62 298	20.999	4	41.00 225	49.834	11	50.50 251
		5			43			30			46	
30.4	61.942		53.77	45.08		97.34	20.969		43.15	49.788		52.90
June 9.4	61.922	20	52.99 78	44.54	54	99.73 239	20.909	60	45.16 201	49.706	82	55.10 220
19.4	61.878	44	52.21 78	43.89	65	101.70 197	20.823	86	46.97 181	49.595	111	57.06 196
29.3	61.811	67	51.43 78	43.15	74	103.20 150	20.710	113	48.51 154	49.456	139	58.69 163
July 9.3	61.724	87	50.70 73	42.34	81	104.20 100	20.576	134	49.75 124	49.293	163	59.98 129
		104			85			152			181	
19.3	61.620		50.01	41.49		104.07	20.424		50.68	49.112		60.90
29.3	61.500	120	49.40 61	40.62	87	104.61 6	20.256	168	51.25 57	48.916	106	61.41 51
Aug. 8.2	61.371	129	48.86 54	39.74	88	104.01 60	20.080	176	51.45 20	48.711	205	61.50 9
18.2	61.236	135	48.42 44	38.87	87	102.89 112	19.901	179	51.29 16	48.504	207	61.18 32
28.2	61.104	132	48.09 33	38.05	82	101.26 163	19.724	177	50.75 54	48.300	204	60.43 75
		124			78			165			192	
Sept. 7.1	60.980		47.91	37.27		99.17	19.559		49.85	48.108		59.27
17.1	60.872	108	47.86 5	36.57	70	96.64 253	19.410	149	48.53 127	47.937	171	57.72 155
27.1	60.789	83	47.99 13	35.96	61	93.73 291	19.288	122	46.96 162	47.793	144	55.79 193
Oct. 7.1	60.735	54	48.33 34	35.46	50	90.50 323	19.200	88	45.01 195	47.686	107	53.51 228
17.0	60.721	174	48.87 54	35.09	37	87.00 350	19.151	49	42.75 226	47.623	63	50.91 260
		30			23			1			12	
27.0	60.751		49.65	34.86		83.32	19.152		40.22	47.611		48.06
Nov. 6.0	60.828	77	50.66 101	34.78	8	79.53 379	19.203	51	37.47 275	47.654	43	44.98 308
16.0	60.954	126	51.90 124	34.87	9	75.72 381	19.307	104	34.56 291	47.754	100	41.77 321
25.9	61.128	174	53.36 146	35.12	25	71.99 373	19.465	303	31.54 303	47.912	158	38.49 328
Dec. 5.9	61.346	218	55.02 168	35.53	41	68.45 354	19.674	209	28.51 303	48.125	213	35.22 327
		258			57			255			264	
15.9	61.604		56.83	36.10		65.19	19.929		25.53	48.389		32.07
25.8	61.891	287	58.73 190	36.79	69	62.33 286	20.222	293	22.72 231	48.694	305	29.14 293
35.8	62.201	310	60.67 194	37.60	81	59.95 238	20.542	320	20.16 256	49.032	338	26.52 262
Mean Place	58.548		39.37	40.819		98.13	17.794		50.85	46.617		59.08
Sec δ , Tan δ	1.001		-0.032	4.150		+4.028	1.163		+0.594	1.281		+0.800
$D\mu a$, $D_w a$	+0.06		0.00	0.00		+0.22	+0.05		+0.03	+0.05		+0.04
$D\mu \delta$, $D_w \delta$	-0.3		-0.6	-0.3		-0.6	-0.3		-0.6	-0.3		-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington on Time.	η Centauri. Mag. 2.6		σ Boötis. Mag. 4.5		α^2 Centauri. Mag. 0.3		β Boötis. Mag. 5.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 30	° ' " -41 47	h m 14 31	° ' " +30 5	h m 14 34	° ' " -60 29	h m 14 35	° ' " +44 44
	s 18.115	" 48.35	s 8.812	" 47.20	s 2.11	" 36.37	s 47.039	" 69.04
a. 0.8	18.115	48.35	8.812	47.20	2.11	36.37	47.039	69.04
10.8	18.530 ⁴¹⁵	49.17 ⁸²	7.146 ³³⁴	44.82 ²³⁸	2.68 ⁵⁷	36.63 ²⁶	47.410 ³⁷¹	68.60 ²⁴⁴
20.8	18.952 ⁴²²	50.32 ¹¹⁵	7.492 ³⁴⁶	42.83 ¹⁹⁹	3.27 ⁵⁰	37.36 ⁷³	47.799 ³⁸⁹	64.64 ¹⁹⁶
30.7	19.370 ⁴¹⁸	51.76 ¹⁴⁴	7.839 ³⁴⁷	41.28 ¹⁵⁵	3.85 ⁵⁸	38.54 ¹¹⁸	48.193 ³⁹⁴	63.24 ¹⁴⁰
b. 9.7	19.773 ⁴⁰³	53.44 ¹⁸⁶	8.177 ³³⁸	40.23 ¹⁰⁵	4.41 ⁵⁶	40.13 ¹⁵⁹	48.581 ³⁸⁸	62.42 ⁸²
	381		320	53	53	193	371	20
19.7	20.154	55.30	8.497	39.70	4.94	42.06	48.952	62.22
u. 1.7	20.506 ³⁵²	57.30 ²⁰⁰	8.791 ²⁹⁴	39.71 ¹	5.43 ⁴⁹	44.29 ²²³	49.293 ³⁴¹	62.63 ⁴¹
11.6	20.825 ³¹⁹	59.37 ²⁰⁷	9.054 ²⁶³	40.22 ⁵¹	5.87 ⁴⁴	46.73 ²⁴⁴	49.598 ³⁰⁵	63.62 ⁹⁹
21.6	21.108 ²⁸³	61.48 ²¹¹	9.282 ²²⁸	41.21 ⁹⁹	6.26 ³⁹	49.36 ²⁶³	49.862 ²⁶⁴	65.12 ¹⁵⁰
31.6	21.352 ²⁴⁴	63.58 ²¹⁰	9.473 ¹⁹¹	42.60 ¹³⁹	6.59 ³³	52.09 ²⁷³	50.080 ²¹⁸	67.06 ¹⁹⁴
	206	206	153	173	28	278	171	229
x. 10.6	21.558	65.64	9.626	44.33	6.87	54.87	50.251	69.35
20.5	21.726 ¹⁶⁸	67.62 ¹⁹⁸	9.740 ¹¹⁴	46.30 ¹⁹⁷	7.08 ²¹	57.65 ²⁷⁸	50.372 ¹²¹	71.91 ²⁵⁶
30.5	21.854 ¹²⁸	69.50 ¹⁸⁸	9.817 ⁷⁷	48.46 ²¹⁶	7.21 ¹³	60.37 ²⁷²	50.448 ⁷⁴	74.62 ²⁷¹
y. 10.5	21.944 ⁹⁰	71.24 ¹⁷⁴	9.859 ⁴²	50.70 ²²⁴	7.30 ⁹	62.96 ²⁵⁹	50.474 ²⁸	77.38 ²⁷⁶
20.4	21.995 ⁵¹	72.81 ¹⁵⁷	9.866 ⁷	52.93 ²²³	7.33 ³	65.41 ²⁴⁵	50.457 ¹⁷	80.10 ²⁷²
	13	140	26	215	4	223	59	257
30.4	22.008	74.21	9.840	55.08	7.29	67.64	50.398	82.67
ne. 9.4	21.984 ²⁴	75.38 ¹¹⁷	9.785 ⁵⁵	57.09 ²⁰¹	7.20 ⁹	69.60 ¹⁹⁶	50.302 ⁹⁶	85.05 ²³⁸
19.4	21.924 ⁶⁰	76.33 ⁹⁵	9.701 ⁸⁴	58.90 ¹⁸¹	7.05 ¹⁵	71.26 ¹⁶⁶	50.171 ¹³¹	87.13 ²⁰⁸
29.3	21.830 ⁹⁴	77.01 ⁶⁸	9.592 ¹⁰⁹	60.46 ¹⁵⁶	6.85 ²⁰	72.58 ¹³²	50.009 ¹⁶²	88.87 ¹⁷⁴
ly. 9.3	21.704 ¹²⁶	77.42 ⁴¹	9.461 ¹³¹	61.72 ¹²⁶	6.60 ²⁵	73.52 ⁹⁴	49.820 ¹⁸⁹	90.24 ¹³⁷
	152	12	149	95	29	52	211	96
19.3	21.552	77.54	9.312	62.67	6.31	74.04	49.609	91.20
29.3	21.378 ¹⁷⁴	77.35 ¹⁹	9.148 ¹⁶⁴	63.27 ⁶⁰	6.00 ³¹	74.13 ⁹	49.382 ²²⁷	91.71 ⁵¹
ug. 8.2	21.190 ¹⁸⁸	76.88 ⁴⁷	8.974 ¹⁷⁴	63.51 ²⁴	5.65 ³⁵	73.78 ³⁵	49.145 ²³⁷	91.78 ⁷
18.2	20.995 ¹⁹⁵	76.10 ⁷⁸	8.796 ¹⁷⁸	63.38 ¹³	5.31 ²⁴	72.99 ⁷⁹	48.904 ²⁴¹	91.39 ³⁹
28.2	20.802 ¹⁹³	75.07 ¹⁰³	8.621 ¹⁷⁵	62.89 ⁴⁹	4.98 ³³	71.79 ¹²⁰	48.668 ²³⁶	90.55 ⁸⁴
	180	127	165	87	80	157	225	128
pt. 7.1	20.622	73.80	8.456	62.02	4.68	70.22	48.443	89.27
17.1	20.466 ¹⁵⁶	72.34 ¹⁴⁶	8.307 ¹⁴⁹	60.78 ¹²⁴	4.42 ²⁶	68.32 ¹⁹⁰	48.240 ²⁰³	87.57 ¹⁷⁰
27.1	20.345 ¹²¹	70.75 ¹⁵⁹	8.184 ¹²³	59.20 ¹⁵⁸	4.20 ²²	66.14 ²¹⁸	48.065 ¹⁷⁵	85.47 ²¹⁰
t. 7.1	20.267 ⁷⁸	69.08 ¹⁶⁷	8.095 ⁸⁹	57.30 ¹⁹⁰	4.06 ¹⁴	63.79 ²³⁵	47.932 ¹³³	83.00 ²⁴⁷
17.0	20.242 ²⁵	67.43 ¹⁶⁶	8.045 ⁵⁰	55.08 ²²²	3.99 ⁷	61.35 ²⁴⁴	47.844 ⁸⁸	80.22 ²⁷⁸
	35	158	3	249	3	244	34	306
27.0	20.277	65.85	8.042	52.59	4.02	58.91	47.810	77.16
v. 6.0	20.376 ⁹⁹	64.44 ¹⁴¹	8.092 ⁵⁰	49.88 ²⁷¹	4.15 ¹³	56.57 ²³⁴	47.834 ²⁴	73.89 ³²⁷
16.0	20.539 ¹⁶³	63.26 ¹¹⁸	8.194 ¹⁰²	46.99 ²⁸⁹	4.36 ²¹	54.45 ²¹²	47.923 ⁸⁹	70.49 ³⁴⁰
25.9	20.766 ²⁸⁷	62.36 ⁹⁰	8.349 ¹⁵⁵	44.00 ²⁹⁹	4.67 ³¹	52.61 ¹⁸⁴	48.073 ¹⁵⁰	67.03 ³⁴⁶
c. 5.9	21.051 ²²⁵	61.82 ⁵⁴	8.555 ²⁰⁸	40.98 ³⁰²	5.05 ³⁸	51.15 ¹⁴⁶	48.283 ²¹⁰	63.61 ³⁴²
	333	18	252	296	46	102	267	328
15.9	21.384	61.64	8.807	38.02	5.51	50.13	48.550	60.33
25.8	21.755 ³⁷¹	61.84 ²⁰	9.096 ²⁸⁹	35.22 ²⁸⁰	6.02 ⁵¹	49.57 ⁵⁶	48.864 ³¹⁴	57.30 ³⁰³
35.8	22.156 ⁴⁰¹	62.43 ⁵⁹	9.415 ³¹⁹	32.66 ²⁵⁶	6.58 ⁵⁶	49.51 ⁶	49.216 ³⁵²	54.60 ²⁷⁰
Place	17.622	53.84	6.649	62.88	1.109	51.67	47.203	87.90
h, Tan δ	1.341	-0.894	1.156	+0.580	2.031	-1.767	1.408	+0.991
D_{α}	+0.08	-0.05	+0.05	+0.03	+0.09	-0.09	+0.04	+0.05
D_{δ}	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Apodis. Mag. 3.8		μ Virginis. Mag. 4.0		ϵ Boëtis. Mag. 2.7		109 Virginis. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 37	° ' -78 41	h m 14 38	° ' - 5 18	h m 14 41	° ' +27 24	h m 14 42	° ' + 2 13
	s	"	s	"	s	"	s	"
Jan. 0.8	35.47	41.20	44.635	13.62	24.487	54.74	6.488	68.57
10.8	36.77 ¹³⁰	40.77 ⁴³	44.954 ³¹⁹	15.46 ¹⁸⁴	24.811 ³²⁴	52.33 ²⁴¹	6.801 ³¹³	66.58 ¹⁹⁰
20.8	38.12 ¹³⁵	40.90 ¹³	45.281 ³²⁷	17.25 ¹⁷⁹	25.149 ³³⁸	50.28 ²⁰⁵	7.122 ³²¹	64.69 ¹⁸⁹
30.8	39.49 ¹³⁷	41.59 ⁶⁹	45.606 ³²⁵	18.96 ¹⁷¹	25.489 ³⁴⁰	48.64 ¹⁶⁴	7.444 ³²²	62.98 ¹⁷¹
Feb. 9.7	40.82 ¹³³	42.81 ¹²²	45.922 ³¹⁶	20.50 ¹⁵⁴	25.822 ³³³	47.48 ¹¹⁶	7.756 ³¹²	61.51 ¹⁴⁷
	128	170	299	135	317	65	296	119
19.7	42.10	44.51	46.221	21.85	26.139	46.83	8.052	60.32
Mar. 1.7	43.30 ¹²⁰	46.65 ²¹⁴	46.497 ²⁷⁶	22.96 ¹¹¹	26.432 ²⁹³	46.69 ¹⁴	8.328 ²⁷⁶	59.43 ⁸⁹
11.6	44.40 ¹¹⁰	49.15 ²⁵⁰	46.748 ²⁵¹	23.82 ⁸⁶	26.697 ²⁶⁵	47.06 ³⁷	8.577 ²⁴⁹	58.86 ⁵⁷
21.6	45.37 ⁹⁷	51.95 ²⁸⁰	46.969 ²²¹	24.41 ⁵⁹	26.930 ²³³	47.89 ⁸³	8.798 ²²¹	58.62 ²⁴
31.6	46.21 ⁸⁴	55.00 ³⁰⁵	47.163 ¹⁹⁴	24.76 ³⁵	27.127 ¹⁹⁷	49.13 ¹²⁴	8.990 ¹⁹²	58.66 ⁴
	69	321	162	11	161	159	161	32
Apr. 10.6	46.90	58.21	47.325	24.87	27.288	50.72	9.151	58.98
20.5	47.44 ⁵⁴	61.52 ³³¹	47.459 ¹³⁴	24.78 ⁹	27.413 ¹²⁵	52.58 ¹⁸⁶	9.283 ¹³²	59.52 ⁵⁴
30.5	47.80 ³⁶	64.86 ³³⁴	47.563 ¹⁰⁴	24.51 ²⁷	27.503 ⁹⁰	54.62 ²⁰⁴	9.386 ¹⁰³	60.25 ⁷³
May 10.5	48.01 ²¹	68.15 ³²⁹	47.638 ⁷⁵	24.11 ⁴⁰	27.557 ⁵⁴	56.77 ²¹⁵	9.459 ⁷³	61.10 ⁸⁵
20.4	48.06 ⁵	71.33 ³¹⁸	47.686 ⁴⁸	23.60 ⁵¹	27.577 ²⁰	58.94 ²¹⁷	9.505 ⁴⁶	62.05 ⁹⁵
	13	300	20	59	12	210	17	100
30.4	47.93	74.33	47.706	23.01	27.565	61.04	9.522	63.05
June 9.4	47.64 ²⁹	77.08 ²⁷⁵	47.699 ⁷	22.37 ⁶⁴	27.524 ⁴¹	63.04 ²⁰⁰	9.514 ⁸	64.06 ¹⁰¹
19.4	47.20 ⁴⁴	79.50 ²⁴²	47.666 ³³	21.70 ⁶⁷	27.453 ⁷¹	64.86 ¹⁸²	9.478 ³⁶	65.05 ⁹⁹
29.3	46.62 ⁵⁸	81.54 ²⁰⁴	47.610 ⁵⁶	21.03 ⁶⁷	27.357 ⁹⁶	66.44 ¹⁵⁸	9.418 ⁶⁰	65.99 ⁹⁴
July 9.3	45.91 ⁷¹	83.14 ¹⁶⁰	47.529 ⁸¹	20.37 ⁶⁶	27.236 ¹²¹	67.76 ¹³²	9.336 ⁸²	66.85 ⁸⁶
	80	114	100	63	140	102	102	75
19.3	45.11	84.28	47.429	19.74	27.096	68.78	9.234	67.63
29.3	44.23 ⁸⁸	84.89 ⁶¹	47.310 ¹¹⁹	19.14 ⁶⁰	26.939 ¹⁵⁷	69.47 ⁶⁹	9.113 ¹²¹	68.28 ⁶⁵
Aug. 8.2	43.30 ⁹³	84.97 ⁸	47.180 ¹³⁰	18.59 ⁵⁵	26.769 ¹⁷⁰	69.82 ³⁵	8.981 ¹³²	68.82 ⁵⁴
18.2	42.37 ⁹³	84.49 ⁴⁸	47.043 ¹³⁷	18.11 ⁴⁸	26.595 ¹⁷⁴	69.83 ¹	8.841 ¹⁴⁰	69.22 ⁴⁰
28.2	41.45 ⁹²	83.48 ¹⁰¹	46.905 ¹³⁸	17.71 ⁴⁰	26.421 ¹⁷⁴	69.47 ³⁶	8.700 ¹⁴¹	69.46 ²⁴
	85	151	131	30	166	72	135	8
Sept. 7.1	40.60	81.97	46.774	17.41	26.255	68.75	8.565	69.54
17.1	39.85 ⁷⁵	79.98 ¹⁹⁹	46.657 ¹¹⁷	17.24 ¹⁷	26.104 ¹⁵¹	67.68 ¹⁰⁷	8.445 ¹²⁰	69.44 ¹⁰
27.1	39.24 ⁶¹	77.61 ²³⁷	46.562 ⁹⁵	17.21 ³	25.977 ¹²⁷	66.28 ¹⁴⁰	8.345 ¹⁰⁰	69.13 ³¹
Oct. 7.1	38.79 ⁴⁵	74.92 ²⁶⁹	46.499 ⁶³	17.35 ¹⁴	25.881 ⁹⁶	64.54 ¹⁷⁴	8.275 ⁷³	68.62 ⁵¹
17.0	38.54 ²⁵	72.02 ²⁹⁰	46.473 ²⁶	17.68 ³³	25.824 ⁵⁷	62.48 ²⁰⁶	8.242 ³⁰	67.87 ⁶¹
	4	301	17	54	12	232	10	98
27.0	38.50	69.01	46.490	18.22	25.812	60.16	8.252	66.89
Nov. 6.0	38.67 ¹⁷	66.02 ²⁹⁹	46.555 ⁶⁵	19.01 ⁷⁹	25.850 ³⁸	57.59 ²⁵⁷	8.309 ⁵⁷	65.67 ¹²²
16.0	39.09 ⁴²	63.15 ²⁸⁷	46.670 ¹¹⁵	20.01 ¹⁰⁰	25.941 ⁹¹	54.83 ²⁷⁶	8.415 ¹⁰⁶	64.23 ¹⁴⁴
25.9	39.71 ⁶²	60.54 ²⁶¹	46.833 ¹⁶³	21.26 ¹²⁵	26.086 ¹⁴⁵	51.95 ²⁸⁸	8.569 ¹⁵⁴	62.57 ¹⁶⁶
Dec. 5.9	40.54 ⁸³	58.27 ²²⁷	47.042 ²⁰⁹	22.70 ¹⁴⁴	26.280 ¹⁹⁴	49.01 ²⁹⁴	8.770 ²⁰¹	60.75 ¹⁸²
	100	184	250	162	240	290	241	195
15.9	41.54	56.43	47.292	24.32	26.520	46.11	9.011	58.80
25.8	42.68 ¹¹⁴	55.09 ¹³⁴	47.573 ²⁸¹	26.06 ¹⁷⁴	26.798 ²⁷⁸	43.32 ²⁷⁹	9.284 ²⁷³	56.78 ²⁰²
35.8	43.93 ¹²⁵	54.29 ⁸⁰	47.880 ³⁰⁷	27.86 ¹⁸⁰	27.107 ³⁰⁹	40.75 ²⁵⁷	9.583 ²⁹⁹	54.77 ²⁰¹
Mean Place	36.274	52.99	44.209	8.54	24.355	69.30	6.118	75.90
Sec δ , Tan δ	5.104	-5.005	1.004	-0.093	1.127	+0.519	1.001	+0.039
$D\psi\alpha$, $D\omega\alpha$	+0.14	-0.26	+0.06	0.00	+0.05	+0.03	+0.06	0.00
$D\psi\delta$, $D\omega\delta$	-0.3	-0.6	-0.3	-0.6	-0.3	-0.8	-0.3	-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	8 Libræ. Mag. 5.3		α Libræ. Mag. 2.9		Groombridge 2164. Mag. 5.7		β Ursæ Minoris. Mag. 2.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 46	° ' " -15 39	h m 14 46	° ' " -15 42	h m 14 49	° ' " +59 37	h m 14 50	° ' " +74 28
Jan. 0.8	9.301	26.95	20.748	8.10	20.506	15.95	52.95	64.25
10.8	9.629 ³²⁸	28.46 ¹⁵¹	21.075 ³²⁷	9.60 ¹⁵⁰	20.959 ⁴⁵³	13.46 ²⁴⁹	53.70 ⁷⁵	61.92 ²³³
20.8	9.967 ³³⁸	30.04 ¹⁵⁸	21.413 ³³⁸	11.18 ¹⁵⁸	21.447 ⁴⁸⁸	11.51 ¹⁹⁵	54.52 ⁸²	60.19 ¹⁷³
30.8	10.304 ³³⁷	31.63 ¹⁵⁹	21.750 ³³⁷	12.78 ¹⁶⁰	21.952 ⁵⁰⁵	10.19 ¹³²	55.39 ⁸⁷	59.08 ¹¹¹
Feb. 9.7	10.632 ³²⁸	33.20 ¹⁵⁷	22.077 ³²⁷	14.34 ¹⁵⁶	22.458 ⁵⁰⁶	9.52 ⁶⁷	56.26 ⁸⁷	58.66 ⁴²
19.7	10.944 ³¹²	34.68 ¹⁴⁸	22.389 ³¹²	15.82 ¹⁴⁸	22.947 ⁴⁸⁹	9.51 ¹	57.11 ⁸⁵	58.92 ²⁶
Mar. 1.7	11.234 ²⁹⁰	36.03 ¹³⁵	22.679 ²⁹⁰	17.16 ¹³⁴	23.405 ⁴⁵⁸	10.17 ⁶⁶	57.91 ⁸⁰	59.85 ⁹³
11.6	11.498 ²⁶⁴	37.21 ¹¹⁸	22.943 ²⁶⁴	18.35 ¹¹⁹	23.819 ⁴¹⁴	11.45 ¹²⁸	58.64 ⁷³	61.39 ¹⁵⁴
21.6	11.735 ²³⁷	38.23 ¹⁰²	23.181 ²³⁸	19.36 ¹⁰¹	24.179 ³⁶⁰	13.28 ¹⁸³	59.26 ⁶²	63.48 ²⁰⁹
31.6	11.942 ²⁰⁷	39.06 ⁸³	23.388 ²⁰⁷	20.20 ⁸⁴	24.476 ²⁹⁷	15.59 ²³¹	59.77 ⁵¹	66.01 ²⁵³
Apr. 10.6	12.121 ¹⁷⁹	39.71 ⁶⁵	23.567 ¹⁷⁹	20.85 ⁶⁵	24.705 ²²⁹	18.27 ²⁶⁸	60.15 ³⁸	68.90 ²⁸⁹
20.5	12.268 ¹⁴⁷	40.20 ⁴⁹	23.715 ¹⁴⁸	21.33 ⁴⁸	24.864 ¹⁵⁹	21.20 ²⁹³	60.38 ²³	72.03 ³¹³
30.5	12.386 ¹¹⁸	40.53 ³³	23.833 ¹¹⁸	21.67 ³⁴	24.951 ⁸⁷	24.30 ³¹⁰	60.48 ¹⁰	75.26 ³²³
May 10.5	12.476 ⁹⁰	40.71 ¹⁸	23.923 ⁹⁰	21.85 ¹⁸	24.970 ¹⁹	27.43 ³¹³	60.43 ⁵	78.49 ³²³
20.5	12.535 ⁵⁹	40.77 ⁶	23.983 ⁶⁰	21.92 ⁷	24.920 ⁵⁰	30.48 ³⁰⁵	60.24 ¹⁹	81.61 ³¹²
30.4	12.566 ³¹	40.73 ⁴	24.014 ³¹	21.88 ⁴	24.807 ¹¹³	33.38 ²⁹⁰	59.93 ³¹	84.52 ²⁹¹
June 9.4	12.569 ³	40.59 ¹⁴	24.018 ⁴	21.75 ¹³	24.636 ¹⁷¹	36.02 ²⁶⁴	59.51 ⁴²	87.14 ²⁶²
19.4	12.542 ²⁷	40.36 ²³	23.991 ²⁷	21.52 ²³	24.412 ²²⁴	38.34 ²³²	58.98 ⁵³	89.38 ²²⁴
29.3	12.490 ⁵²	40.06 ³⁰	23.939 ⁵²	21.23 ²⁹	24.142 ²⁷⁰	40.25 ¹⁹¹	58.36 ⁶²	91.20 ¹⁸²
July 9.3	12.412 ⁷⁸	39.70 ³⁶	23.861 ⁷⁸	20.86 ³⁷	23.832 ³¹⁰	41.74 ¹⁴⁹	57.68 ⁶⁸	92.54 ¹³⁴
19.3	12.312 ¹⁰⁰	39.27 ⁴³	23.761 ¹⁰⁰	20.44 ⁴²	23.491 ³⁴¹	42.75 ¹⁰¹	56.94 ⁷⁴	93.38 ⁸⁴
29.3	12.191 ¹²¹	38.78 ⁴⁹	23.640 ¹²¹	19.95 ⁴⁹	23.127 ³⁶⁴	43.26 ⁵¹	56.16 ⁷⁸	93.68 ³⁰
Aug. 8.2	12.057 ¹³⁴	38.25 ⁵³	23.506 ¹³⁴	19.42 ⁵³	22.749 ³⁷⁸	43.27 ¹	55.36 ⁸⁰	93.47 ²¹
18.2	11.915 ¹⁴²	37.68 ⁵⁷	23.363 ¹⁴³	18.85 ⁵⁷	22.366 ³⁸³	42.76 ⁵¹	54.55 ⁸¹	92.71 ⁷⁶
28.2	11.770 ¹⁴⁵	37.09 ⁵⁹	23.217 ¹⁴⁶	18.26 ⁵⁹	21.988 ³⁷⁸	41.75 ¹⁰¹	53.77 ⁷⁸	91.45 ¹²⁶
Sept. 7.2	11.630 ¹⁴⁰	36.51 ⁵⁸	23.078 ¹³⁹	17.67 ⁵⁹	21.628 ³⁶⁰	40.25 ¹⁵⁰	53.02 ⁷⁵	89.70 ¹⁷⁵
17.1	11.506 ¹²⁴	35.95 ⁵⁶	22.953 ¹²⁵	17.11 ⁵⁶	21.294 ³³⁴	38.29 ¹⁹⁶	52.33 ⁶⁹	87.48 ²²²
27.1	11.404 ¹⁰²	35.46 ⁴⁹	22.850 ¹⁰³	16.61 ⁵⁰	21.000 ²⁹⁴	35.91 ²³⁸	51.72 ⁶¹	84.84 ²⁶⁴
Oct. 7.1	11.333 ⁷¹	35.06 ⁴⁰	22.780 ⁷²	16.21 ⁴⁰	20.757 ²⁴³	33.14 ²⁷⁷	51.20 ⁵²	81.83 ³⁰¹
17.0	11.301 ³²	34.80 ²⁶	22.748 ³⁰	15.95 ²⁶	20.575 ¹⁸²	30.02 ³¹²	50.78 ⁴²	78.53 ³³⁰
27.0	11.315 ¹⁴	34.71 ⁹	22.761 ¹³	15.86 ⁹	20.462 ¹¹³	26.64 ³³⁸	50.50 ²⁸	74.96 ³⁵⁷
Nov. 6.0	11.378 ⁶³	34.82 ¹¹	22.824 ⁶³	15.96 ¹⁰	20.427 ³⁵	23.05 ³⁵⁹	50.34 ¹⁶	71.25 ³⁷¹
16.0	11.492 ¹¹⁴	35.17 ³⁵	22.939 ¹¹⁵	16.31 ³⁵	20.476 ⁴⁹	19.35 ³⁷⁰	50.33 ¹	67.45 ³⁸⁰
25.9	11.657 ¹⁶⁵	35.76 ⁵⁹	23.104 ¹⁶⁵	16.90 ⁵⁹	20.609 ¹³³	15.62 ³⁷³	50.48 ¹⁵	63.68 ³⁷⁷
Dec. 5.9	11.870 ²¹³	36.59 ⁸³	23.317 ²¹³	17.72 ⁸²	20.825 ²¹⁶	11.96 ³⁶⁶	50.78 ³⁰	60.02 ³⁶⁶
15.9	12.126 ²⁵⁶	37.64 ¹⁰⁵	23.573 ²⁵⁶	18.78 ¹⁰⁶	21.121 ²⁹⁶	8.50 ³⁴⁶	51.22 ⁴⁴	56.61 ³⁴¹
25.9	12.415 ²⁸⁹	38.90 ¹²⁶	23.861 ²⁸⁸	20.04 ¹²⁶	21.485 ³⁶⁴	5.33 ³¹⁷	51.79 ⁵⁷	53.53 ³⁰⁸
35.8	12.730 ³¹⁵	40.32 ¹⁴²	24.176 ³¹⁵	21.45 ¹⁴¹	21.909 ⁴²⁴	2.55 ²⁷⁸	52.48 ⁶⁹	50.89 ²⁶⁴
Mean Place	8.875	25.12	20.322	6.28	21.444	36.52	55.858	86.09
Sec δ, Tan δ	1.039	-0.280	1.039	-0.281	1.977	+1.706	3.739	+3.603
D _ψ α, D _ω α	+0.07	-0.01	+0.07	-0.01	+0.03	+0.08	0.00	+0.18
D _ψ δ, D _ω δ	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ^3 Libræ. Mag. 5.6		Piazzi 221. Mag. 5.8		β Lupi. Mag. 2.8		δ Libræ. Var. 4.8-6.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 52	° ' " -11 4	h m 14 52	° ' " +14 46	h m 14 53	° ' " -42 48	h m 14 56	° ' " - 8 11
Jan. 0.8	19.314	49.29	21.141	26.46	9.458	11.20	35.647	43.46
10.8	19.634 ³²⁰	50.90 ¹⁶¹	21.449 ³⁰⁸	24.20 ²²⁶	9.868 ⁴¹⁰	11.73 ⁵³	35.961 ³¹⁴	45.14 ¹⁶⁸
20.8	19.963 ³²⁹	52.54 ¹⁶⁴	21.768 ³¹⁹	22.18 ²⁰²	10.292 ⁴²⁴	12.60 ⁸⁷	36.286 ³²⁵	46.81 ¹⁶⁷
30.8	20.294 ³³¹	54.15 ¹⁶¹	22.092 ³²⁴	20.46 ¹⁷³	10.717 ⁴²⁵	13.78 ¹¹⁸	36.613 ³²⁷	48.41 ¹⁶⁰
Feb. 9.7	20.617 ³²³	55.67 ¹⁵²	22.409 ³¹⁷	19.08 ¹³⁸	11.134 ⁴¹⁷	15.19 ¹⁴¹	36.934 ³²¹	49.92 ¹⁵¹
	308	139	303	96	398	163	305	134
19.7	20.925	57.06	22.712	18.12	11.532	16.82	37.239	51.26
Mar. 1.7	21.213 ²⁸⁸	58.27 ¹²¹	22.995 ²⁸³	17.58 ⁵⁴	11.906 ³⁷⁴	18.59 ¹⁷⁷	37.526 ²⁸⁷	52.39 ¹¹³
11.7	21.476 ²⁶³	59.29 ¹⁰²	23.253 ²⁵⁸	17.46 ¹²	12.250 ³⁴⁴	20.47 ¹⁸⁸	37.789 ²⁶³	53.30 ⁹¹
21.6	21.713 ²³⁷	60.08 ⁷⁹	23.484 ²³¹	17.75 ²⁹	12.561 ³¹¹	22.42 ¹⁹⁵	38.027 ²³⁸	53.96 ⁸⁶
31.6	21.921 ²⁰⁸	60.67 ⁵⁹	23.683 ¹⁹⁹	18.41 ⁶⁶	12.837 ²⁷⁶	24.39 ¹⁹⁷	38.236 ²⁰⁰	54.40 ⁴⁴
	180	39	168	97	237	196	181	21
Apr. 10.6	22.101	61.06	23.851	19.38	13.074	26.35	38.417	54.61
20.5	22.251 ¹⁵⁰	61.25 ¹⁹	23.989 ¹³⁸	20.63 ¹²⁵	13.274 ²⁰⁰	28.27 ¹⁹²	38.568 ¹⁵¹	54.64 ³
30.5	22.371 ¹²⁰	61.29 ⁴	24.095 ¹⁰⁶	22.06 ¹⁴³	13.435 ¹⁶¹	30.12 ¹⁸⁵	38.691 ¹²³	54.49 ¹⁵
May 10.5	22.464 ⁹³	61.19 ¹⁰	24.170 ⁷⁵	23.63 ¹⁵⁷	13.556 ¹²¹	31.86 ¹⁷⁴	38.786 ⁹⁵	54.20 ²⁹
20.5	22.527 ⁶³	60.96 ²³	24.216 ⁴⁶	25.27 ¹⁶⁴	13.638 ⁸²	33.48 ¹⁶²	38.851 ⁶⁵	53.80 ⁴⁰
	35	31	15	163	41	147	38	48
30.4	22.562	60.65	24.231	26.90	13.679	34.95	38.889	53.32
June 9.4	22.569 ⁷	60.27 ³⁸	24.217 ¹⁴	28.50 ¹⁶⁰	13.681 ²	36.23 ¹²⁸	38.897 ⁸	52.78 ⁵⁴
19.4	22.547 ²²	59.83 ⁴⁴	24.176 ⁴¹	29.99 ¹³⁹	13.642 ³⁹	37.30 ¹⁰⁷	38.877 ²⁰	52.21 ⁵⁷
29.4	22.499 ⁴⁸	59.35 ⁴⁸	24.109 ⁶⁷	31.35 ¹⁴⁶	13.565 ⁷⁷	38.15 ⁸⁵	38.831 ⁴⁶	51.62 ⁵⁹
July 9.3	22.425 ⁷⁴	58.84 ⁶¹	24.018 ⁹¹	32.53 ¹¹⁸	13.453 ¹¹²	38.73 ⁵⁸	38.759 ⁷²	51.02 ⁶⁰
	96	52	113	98	144	30	95	59
19.3	22.329	58.32	23.905	33.51	13.309	39.03	38.664	50.43
29.3	22.212 ¹¹⁷	57.78 ⁵⁴	23.775 ¹³⁰	34.27 ⁷⁶	13.137 ¹⁷²	39.05 ²	38.549 ¹¹⁵	49.86 ⁵⁷
Aug. 8.2	22.081 ¹³¹	57.24 ⁵⁴	23.631 ¹⁴⁴	34.80 ⁵³	12.946 ¹⁹¹	38.77 ²⁸	38.419 ¹³⁰	49.31 ⁵⁵
18.2	21.940 ¹⁴¹	56.71 ⁵³	23.478 ¹⁵³	35.07 ²⁷	12.744 ²⁰²	38.19 ⁵⁸	38.278 ¹⁴¹	48.81 ⁵⁰
28.2	21.796 ¹⁴⁴	56.21 ⁵⁰	23.322 ¹⁵⁶	35.07 ⁰	12.538 ²⁰⁶	37.34 ⁸⁵	38.134 ¹⁴⁴	48.36 ⁴⁵
	139	46	150	26	197	112	141	38
Sept. 7.2	21.657 ¹²⁶	55.75 ³⁹	23.172 ¹³⁸	34.81 ⁵⁴	12.341 ¹⁷⁷	36.22 ¹³³	37.993 ¹²⁹	47.98 ²⁸
17.1	21.531 ¹⁰⁶	55.36 ²⁸	23.034 ¹¹⁶	34.27 ⁸³	12.164 ¹⁴⁷	34.89 ¹⁵⁰	37.864 ¹⁰⁷	47.70 ¹⁷
27.1	21.425 ⁷⁵	55.08 ¹⁷	22.918 ⁸⁸	33.44 ²¹³	12.017 ¹⁰⁶	33.39 ¹³²	37.757 ⁷⁹	47.53 ²
Oct. 7.1	21.350 ³⁷	54.91 ¹	22.829 ⁵²	32.32 ¹¹²	11.911 ⁵³	31.78 ¹⁶¹	37.678 ⁴²	47.51 ¹⁵
17.1	21.313 ⁶	54.90 ¹⁸	22.777 ⁹	30.94 ¹⁶⁶	11.858 ⁵	30.13 ¹⁶¹	37.636 ¹	47.66 ³⁴
27.0	21.319	55.08	22.768	29.28	11.863	28.52	37.637	48.00
Nov. 6.0	21.373 ⁵⁴	55.46 ³⁸	22.805 ³⁷	27.38 ¹⁹⁰	11.933 ⁷⁰	27.01 ¹⁵¹	37.685 ⁴⁸	48.55 ⁵⁵
16.0	21.478 ¹⁰⁵	56.07 ⁶¹	22.893 ⁸⁸	25.25 ²¹³	12.070 ¹³⁷	25.69 ¹⁰⁶	37.783 ⁹⁸	49.33 ⁷⁵
25.9	21.633 ¹⁵⁵	56.90 ⁸³	23.031 ¹³⁸	22.96 ²²⁹	12.271 ²⁰¹	24.63 ¹⁰⁶	37.932 ¹⁴⁹	50.32 ⁹⁹
Dec. 5.9	21.836 ²⁰³	57.96 ¹⁰⁶	23.216 ¹⁸⁵	20.54 ²⁴²	12.534 ²⁶³	23.87 ⁷⁶	38.128 ¹⁹⁶	51.54 ¹²²
	245	127	228	247	316	43	237	140
15.9	22.081	59.23	23.444	18.07	12.850	23.44	38.365	52.94
25.9	22.359 ²⁷⁸	60.66 ¹⁴³	23.709 ²⁶⁵	15.62 ²⁴⁵	13.210 ³⁶⁰	23.38 ⁶	38.638 ²⁷³	54.47 ¹⁵³
35.8	22.665 ³⁰⁶	62.21 ¹⁵⁵	24.001 ²⁹²	13.27 ²³⁵	13.603 ³⁹³	23.68 ³⁰	38.938 ³⁰⁰	56.12 ¹⁶⁵
Mean Place	18.931	46.17	20.923	37.18	9.093	16.71	35.295	39.53
Sec δ , Tan δ	1.019	-0.196	1.034	+0.264	1.363	-0.926	1.010	-0.144
$D\psi a$, $D_{\omega} a$	+0.07	-0.01	+0.06	+0.01	+0.08	-0.04	+0.06	-0.01
$D\psi \delta$, $D_{\omega} \delta$	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	β Boötis. Mag. 3.6		γ Scorpii. Mag. 3.4		ψ Boötis. Mag. 4.7		ϵ Boötis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 58	° ' " +40 42	h m 14 59	° ' " -24 57	h m 15 0	° ' " +27 15	h m 15 3	° ' " +25 10
i. 0.8	51.195	31.35	16.394	36.57	55.918	46.43	41.987	62.94
10.8	51.537 ³⁴²	28.75 ²⁶⁰	16.736 ³⁴²	37.69 ¹¹²	56.230 ³¹²	43.95 ²⁴⁸	42.297 ³¹⁰	60.48 ²⁴⁶
20.8	51.900 ³⁶³	26.59 ²¹⁶	17.090 ³⁵⁴	38.97 ¹²⁸	56.559 ³²⁹	41.80 ²¹⁵	42.623 ³²⁶	58.33 ²¹⁵
30.8	52.272 ³⁷²	24.93 ¹⁶⁶	17.445 ³⁵⁵	40.36 ¹³⁹	56.895 ³³⁶	40.06 ¹⁷⁴	42.956 ³³³	56.57 ¹⁷⁶
b. 9.7	52.643 ³⁷¹	23.84 ¹⁰⁹	17.792 ³⁴⁷	41.83 ¹⁴⁷	57.228 ³³³	38.79 ¹²⁷	43.286 ³³⁰	55.26 ¹³¹
	52.643 ³⁵⁷	23.84 ⁴⁸	17.792 ³³⁴	41.83 ¹⁴⁸	57.228 ³²¹	38.79 ⁷⁸	43.286 ³¹⁹	55.26 ⁸²
19.7	53.000	23.36	18.126	43.31	57.549	38.03	43.605	54.44
r. 1.7	53.338 ³³⁸	23.47 ¹¹	18.439 ³¹³	44.77 ¹⁴⁶	57.850 ³⁰¹	37.79 ²⁴	43.904 ²⁹⁹	54.12 ³²
11.7	53.645 ³⁰⁷	24.16 ⁶⁹	18.729 ²⁹⁰	46.17 ¹⁴⁰	58.127 ²⁷⁷	38.05 ²⁶	44.180 ²⁷⁶	54.30 ¹⁸
21.6	53.918 ²⁷³	25.39 ¹²³	18.990 ²⁶¹	47.48 ¹³¹	58.373 ²⁴⁶	38.81 ⁷⁰	44.427 ²⁴⁷	54.96 ⁶⁶
31.6	54.152 ²³⁴	27.09 ¹⁷⁰	19.223 ²³³	48.66 ¹¹⁸	58.587 ²¹⁴	40.00 ¹¹⁹	44.642 ²¹⁵	56.05 ¹⁰⁹
	54.152 ¹⁹¹	27.09 ²⁰⁹	19.223 ²⁰³	48.66 ¹⁰⁹	58.587 ¹⁸⁰	40.00 ¹⁵⁵	44.642 ¹⁸³	56.05 ¹⁴⁶
r. 10.6	54.343	29.18	19.426	49.75	58.767	41.55	44.825	57.50
20.5	54.491 ¹⁴⁸	31.57 ²³⁹	19.598 ¹⁷²	50.71 ⁹⁶	58.913 ¹⁴⁶	43.40 ¹⁸⁵	44.972 ¹⁴⁷	59.25 ¹⁷⁵
30.5	54.596 ¹⁰⁵	34.17 ²⁶⁰	19.740 ¹⁴²	51.54 ⁸³	59.022 ¹⁰⁹	45.46 ²⁰⁶	45.086 ¹¹⁴	61.21 ¹⁹⁶
y 10.5	54.657 ⁶¹	36.86 ²⁶⁹	19.850 ¹¹⁰	52.24 ⁷⁰	59.096 ⁷⁴	47.64 ²¹⁸	45.165 ⁷⁹	63.31 ²¹⁰
20.5	54.677 ²⁰	39.56 ²⁷⁰	19.928 ⁷⁸	52.84 ⁶⁰	59.138 ⁴²	49.87 ²²³	45.212 ⁴⁷	65.45 ²¹⁴
	54.677 ²²	39.56 ²⁶¹	19.928 ⁴⁸	52.84 ⁴⁷	59.138 ⁶	49.87 ²²⁰	45.212 ¹³	65.45 ²¹²
30.4	54.655	42.17	19.976	53.31	59.144	52.07	45.225	67.57
ne 9.4	54.596 ⁵⁹	44.63 ²⁴⁶	19.990 ¹⁴	53.66 ³⁵	59.118 ²⁶	54.16 ²⁰⁹	45.206 ¹⁹	69.61 ²⁰⁴
19.4	54.501 ⁹⁵	46.85 ²²²	19.973 ¹⁷	53.88 ²²	59.062 ⁵⁶	56.10 ¹⁹⁴	45.157 ⁴⁹	71.50 ¹⁸⁹
29.4	54.372 ¹²⁹	48.78 ¹⁹³	19.926 ⁴⁷	53.99 ¹¹	58.977 ⁸⁵	57.81 ¹⁷¹	45.078 ⁷⁹	73.18 ¹⁶⁸
ly 9.3	54.213 ¹⁵⁹	50.37 ¹⁵⁹	19.849 ⁷⁷	53.96 ³	58.865 ¹¹²	59.27 ¹⁴⁶	44.974 ¹⁰⁴	74.63 ¹⁴⁶
	54.213 ¹⁸³	50.37 ¹²⁰	19.849 ¹⁰³	53.96 ¹⁶	58.865 ¹³⁵	59.27 ¹¹⁷	44.974 ¹²⁹	74.63 ¹¹⁶
19.3	54.030	51.57	19.746	53.80	58.730	60.44	44.845	75.79
29.3	53.825 ²⁰⁵	52.37 ⁸⁰	19.620 ¹²⁶	53.49 ³¹	58.575 ¹⁵⁵	61.28 ⁸⁴	44.697 ¹⁴⁸	76.66 ⁸⁷
ug. 8.2	53.606 ²¹⁹	52.74 ³⁷	19.476 ¹⁴⁴	53.06 ⁴³	58.404 ¹⁷¹	61.79 ⁵¹	44.532 ¹⁶⁵	77.19 ⁵³
18.2	53.378 ²²⁸	52.67 ⁷	19.321 ¹⁵⁵	52.50 ⁵⁶	58.225 ¹⁷⁹	61.95 ¹⁶	44.359 ¹⁷³	77.38 ¹⁹
28.2	53.150 ²²⁸	52.17 ⁵⁰	19.161 ¹⁶⁰	51.82 ⁶⁸	58.043 ¹⁸²	61.74 ²¹	44.182 ¹⁷⁷	77.23 ¹⁵
	53.150 ²²²	52.17 ⁹⁴	19.161 ¹⁵⁵	51.82 ⁷⁶	58.043 ¹⁷⁸	61.74 ⁵⁷	44.182 ¹⁷⁴	77.23 ⁴⁹
pt. 7.2	52.928	51.23	19.006	51.06	57.865	61.17	44.008	76.74
17.1	52.722 ²⁰⁶	49.87 ¹³⁶	18.864 ¹⁴²	50.24 ⁸²	57.702 ¹⁶³	60.24 ⁹³	43.847 ¹⁶¹	75.89 ⁸⁵
27.1	52.540 ¹⁸²	48.09 ¹⁷⁸	18.745 ¹¹⁹	49.40 ⁸⁴	57.556 ¹⁴⁶	58.96 ¹²⁸	43.705 ¹⁴²	74.69 ¹²⁰
t. 7.1	52.393 ¹⁴⁷	45.93 ²¹⁶	18.659 ⁸⁶	48.58 ⁸²	57.441 ¹¹⁵	57.33 ¹⁶³	43.593 ¹¹²	73.15 ¹⁵⁴
17.1	52.287 ¹⁰⁶	43.43 ²⁵⁰	18.614 ⁴⁵	47.82 ⁷⁶	57.364 ⁷⁷	55.39 ¹⁹⁴	43.517 ⁷⁶	71.31 ¹⁸⁴
	52.287 ⁵⁶	43.43 ²⁸⁰	18.614 ²	47.82 ⁶⁴	57.364 ³³	55.39 ²²⁵	43.517 ³²	71.31 ²¹⁴
27.0	52.231	40.63	18.616	47.18	57.331	53.14	43.485	69.17
v. 6.0	52.232 ¹	37.56 ³⁰⁷	18.670 ⁵⁴	46.70 ⁴⁸	57.347 ¹⁶	50.63 ²⁵¹	43.501 ¹⁶	66.77 ²⁴⁰
16.0	52.290 ⁵⁸	34.32 ³²⁴	18.779 ¹⁰⁹	46.44 ²⁶	57.415 ⁶⁸	47.92 ²⁷¹	43.569 ⁶⁸	64.15 ²⁶²
25.9	52.409 ¹¹⁹	30.98 ³³⁴	18.943 ¹⁶⁴	46.40 ⁴	57.537 ¹²²	45.06 ²⁸⁶	43.689 ¹²⁰	61.38 ²⁷⁷
c. 5.9	52.587 ¹⁷⁸	27.62 ³³⁶	19.158 ²¹⁵	46.63 ²³	57.711 ¹⁷⁴	42.13 ²⁹³	43.860 ¹⁷¹	58.53 ²⁸⁵
	52.587 ²³³	27.62 ³²⁹	19.158 ²⁵⁹	46.63 ⁴⁹	57.711 ²²¹	42.13 ²⁹³	43.860 ²¹⁹	58.53 ²⁸⁶
15.9	52.820	24.33	19.417	47.12	57.932	39.20	44.079	55.67
25.9	53.101 ²⁸¹	21.24 ³⁰⁹	19.715 ²⁹⁸	47.87 ⁷⁵	58.194 ²⁶²	36.37 ²⁸³	44.338 ²⁵⁹	52.88 ²⁷⁹
35.8	53.421 ³²⁰	18.42 ²⁸²	20.040 ³²⁵	48.84 ⁹⁷	58.489 ²⁹⁵	33.74 ²⁶³	44.630 ²⁹²	50.28 ²⁶⁰
Place	51.442	48.16	16.017	37.46	55.905	60.10	41.961	75.97
Tan δ	1.319	+0.860	1.103	-0.466	1.125	+0.515	1.105	+0.470
D ₀ α	+0.05	+0.04	+0.07	-0.02	+0.05	+0.02	+0.05	+0.02
D ₀ δ	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♈ Lupi. Mag. 3.5		♌ Libræ. Mag. 4.7		♎ Serpentis. Mag. 5.4		♏ Triang. Aust. Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 6	° ' " -51 47	h m 15 7	° ' " -19 28	h m 15 11	° ' " + 5 14	h m 15 11	° ' " -68 22
Jan. 0.9	23.320	9.24	32.942	56.94	6.893	27.47	13.62	30.87
10.8	23.785 ⁴⁶⁵	9.29 ⁵	33.268 ³²⁶	58.19 ¹²⁵	7.192 ²⁹⁹	25.43 ²⁰⁴	14.33 ⁷¹	30.26 ⁶¹
20.8	24.269 ⁴⁸⁴	9.74 ⁴⁵	33.606 ³³⁸	59.55 ¹³⁶	7.504 ³¹²	23.53 ¹⁹⁰	15.08 ⁷⁶	30.15 ¹¹
30.8	24.759 ⁴⁹⁰	10.56 ⁸²	33.948 ³⁴²	60.97 ¹⁴²	7.822 ³¹⁸	21.83 ¹⁷⁰	15.86 ⁷⁸	30.54 ³⁴
Feb. 9.7	25.244 ⁴⁸⁵	11.73 ¹¹⁷	34.286 ³³⁸	62.40 ¹⁴³	8.136 ³¹⁴	20.38 ¹⁴⁵	16.62 ⁷⁶	31.38 ⁵⁹
19.7	25.713 ⁴⁶⁹	13.18 ¹⁴⁵	34.610 ³²⁴	63.79 ¹³⁹	8.439 ³⁰³	19.24 ¹¹⁴	17.37 ⁷⁵	32.67 ¹²⁹
Mar. 1.7	26.157 ⁴⁴⁴	14.89 ¹⁷¹	34.915 ³⁰⁵	65.09 ¹³⁰	8.726 ²⁸⁷	18.44 ⁸⁰	18.08 ⁷¹	32.67 ¹⁶⁷
11.7	26.569 ⁴¹²	16.79 ¹⁹⁰	35.199 ²⁸⁴	66.28 ¹¹⁹	8.991 ²⁶⁵	17.98 ⁴⁶	18.75 ⁶⁷	34.34 ²⁰¹
21.6	26.947 ³⁷⁸	18.85 ²⁰⁶	35.457 ²⁵⁸	67.34 ¹⁰⁶	9.232 ²⁴¹	17.88 ¹⁰	19.37 ⁶²	36.35 ²²
31.6	27.284 ³³⁷	21.01 ²¹⁶	35.688 ²³¹	68.26 ⁹²	9.446 ²¹⁴	18.10 ²²	19.92 ⁵⁶	38.64 ²⁵³
Apr. 10.6	27.579 ²⁰⁵	23.23 ²²²	35.890 ²⁰²	69.02 ⁷⁶	9.632 ¹⁸⁶	18.60 ⁵⁰	20.39 ⁴⁷	41.17 ²⁶⁹
20.6	27.830 ²⁵¹	25.47 ²²⁴	36.063 ¹⁷³	69.64 ⁶²	9.789 ¹⁵⁷	19.36 ⁷⁶	20.80 ⁴¹	43.86 ²⁸¹
30.5	28.034 ²⁰⁴	27.70 ²²³	36.207 ¹⁴⁴	70.13 ⁴⁹	9.917 ¹²⁸	20.31 ⁹⁵	21.11 ³¹	46.67 ²⁸⁷
May 10.5	28.191 ¹⁵⁷	29.87 ²¹⁷	36.321 ¹¹⁴	70.49 ³⁶	10.017 ¹⁰⁰	21.41 ¹¹⁰	21.35 ²⁴	49.54 ²⁸⁶
20.5	28.299 ¹⁰⁸	31.94 ²⁰⁷	36.404 ⁸³	70.73 ²⁴	10.087 ⁷⁰	22.61 ¹²⁰	21.49 ¹⁴	52.40 ²⁸¹
30.4	28.357 ⁵⁸	33.88 ¹⁹⁴	36.458 ⁵⁴	70.87 ¹⁴	10.128 ⁴¹	23.85 ¹²⁴	21.55 ⁶	55.21 ²⁸⁹
June 9.4	28.365 ⁸	35.64 ¹⁷⁶	36.479 ²¹	70.92 ⁵	10.140 ¹²	25.09 ¹²⁴	21.52 ³	57.90 ²³⁰
19.4	28.323 ⁴²	37.17 ¹⁵³	36.471 ⁸	70.89 ³	10.123 ¹⁷	26.30 ¹²¹	21.41 ¹¹	60.40 ²²⁶
29.4	28.233 ⁹⁰	38.45 ¹²⁸	36.432 ³⁹	70.76 ¹³	10.077 ⁴⁶	27.42 ¹¹²	21.21 ²⁰	62.66 ¹⁸⁶
July 9.3	28.098 ¹³⁵	39.45 ¹⁰⁸	36.364 ⁶⁸	70.54 ²²	10.006 ⁷¹	28.44 ¹⁰²	20.93 ²⁸	64.62 ¹⁶¹
19.3	27.922 ¹⁷⁶	40.12 ⁶⁷	36.270 ⁹⁴	70.26 ²⁸	9.911 ⁹⁵	29.35 ⁹¹	20.59 ³⁴	66.23 ¹²¹
29.3	27.711 ²¹¹	40.45 ³³	36.152 ¹¹⁸	70.26 ³⁷	9.794 ¹¹⁷	30.10 ⁷⁵	20.19 ⁴⁰	67.44 ⁷⁸
Aug. 8.3	27.475 ²³⁶	40.41 ⁴	36.017 ¹³⁵	69.89 ⁴⁵	9.661 ¹³³	30.71 ⁶¹	20.19 ⁴⁵	68.22 ³⁰
18.2	27.224 ²⁵¹	40.01 ⁴⁰	35.868 ¹⁴⁹	69.44 ⁵²	9.515 ¹⁴⁶	31.14 ⁴³	19.74 ⁴⁷	68.52 ¹⁸
28.2	26.966 ²⁵⁸	39.24 ⁷⁷	35.714 ¹⁵⁴	68.92 ⁵⁷	9.364 ¹⁵¹	31.38 ²⁴	19.27 ⁴⁷	68.34 ⁶⁶
Sept. 7.2	26.715 ²⁵¹	38.13 ¹¹¹	35.562 ¹⁵²	68.35 ⁶¹	9.215 ¹⁴⁹	31.44 ⁶	18.80 ⁴⁶	67.68 ¹¹⁴
17.1	26.485 ²³⁰	36.73 ¹⁴⁰	35.421 ¹⁴¹	67.74 ⁶³	9.074 ¹⁴¹	31.28 ¹⁶	18.34 ⁴¹	66.54 ¹³⁷
27.1	26.290 ¹⁹⁵	35.05 ¹⁶⁸	35.302 ¹¹⁹	67.11 ⁶¹	8.953 ¹²¹	30.91 ³⁷	17.93 ⁶⁷	64.97 ¹⁹⁶
Oct. 7.1	26.143 ¹⁴⁷	33.20 ¹⁸⁵	35.211 ⁹¹	66.50 ⁵⁶	8.857 ⁹⁶	30.30 ⁶¹	17.56 ²⁹	63.01 ²²⁷
17.1	26.054 ⁸⁹	31.21 ¹⁹⁹	35.159 ⁵²	65.94 ⁴⁵	8.796 ⁶¹	29.47 ⁸³	17.27 ¹⁹	60.74 ²⁵²
27.0	26.034 ²⁰	29.19 ²⁰²	35.152 ⁷	65.40 ³⁴	8.776 ²⁰	28.38 ¹⁰⁹	17.08 ⁸	58.22 ²⁸³
Nov. 6.0	26.088 ⁵⁴	27.21 ¹⁹⁸	35.152 ⁴³	65.15 ¹⁶	8.776 ²⁵	28.38 ¹³¹	17.00 ⁵	55.57 ²⁸⁸
16.0	26.221 ¹³³	25.37 ¹⁸⁴	35.195 ⁹⁶	64.99 ⁵	8.801 ⁷⁵	27.07 ¹⁵⁵	17.05 ¹⁶	52.89 ²⁸⁰
26.0	26.430 ²⁰⁹	23.75 ¹⁶²	35.291 ¹⁴⁹	65.04 ²⁷	8.876 ¹²⁵	25.52 ¹⁷⁵	17.21 ²⁹	50.29 ²⁴⁴
Dec. 5.9	26.430 ²⁰⁹	23.75 ¹⁶²	35.440 ¹⁹⁹	65.31 ⁵¹	9.001 ¹⁷²	23.77 ¹⁹⁰	17.50 ⁴¹	47.85 ²¹⁵
15.9	26.712 ³⁴⁶	22.41 ⁹⁹	35.639 ²⁴⁴	65.82 ⁷⁵	9.173 ²¹⁶	21.87 ²⁰²	17.91 ⁵²	45.70 ¹⁸⁰
25.9	27.058 ⁴⁰⁰	21.42 ⁶¹	35.883 ²⁸¹	66.57 ⁹⁶	9.389 ²⁵³	19.85 ²⁰⁸	18.43 ⁶⁰	43.90 ¹³⁹
35.8	27.458 ⁴⁴¹	20.81 ²¹	36.164 ³¹⁰	67.53 ¹¹⁵	9.642 ²⁸²	17.77 ²⁰⁸	19.03 ⁶⁸	42.51 ⁹⁰
Mean Place	23.112	16.48	32.607	56.34	6.687	34.92	13.917	40.68
Sec δ, Tan δ	1.617	-1.270	1.061	-0.354	1.004	+0.092	2.715	-2.523
$D\psi\alpha, D\omega\alpha$	+0.08	-0.06	+0.07	-0.02	+0.06	0.00	+0.11	-0.11
$D\psi\delta, D\omega\delta$	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	δ Boötis. Mag. 3.5		β Libræ. Mag. 2.7		γ Ursæ Minoris. Mag. 3.1		μ Boötis pr. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 12	° ' " +33 36	h m 15 12	° ' " - 9 4	h m 15 20	° ' " +72 7	h m 15 21	° ' " +37 39
a. 0.9	11.650	57.49	35.800	55.56	47.99	13.19	23.233	35.90
10.8	11.966 ³¹⁶	54.87 ²⁶²	36.108 ³⁰⁸	57.14 ¹⁶⁸	48.59 ⁶⁰	10.54 ²⁶⁵	23.550 ³¹⁷	33.21 ²⁶⁹
20.8	12.303 ³³⁷	52.63 ²²⁴	36.429 ³²¹	58.74 ¹⁶⁰	49.27 ⁶⁸	8.42 ²¹²	23.890 ³⁴⁰	30.90 ²³¹
30.8	12.650 ³⁴⁷	50.84 ¹⁷⁹	36.755 ³²⁶	60.29 ¹⁵⁵	50.00 ⁷³	6.90 ¹⁵²	24.246 ³⁵⁶	29.06 ¹⁸⁴
b. 9.7	12.997 ³⁴⁷	49.57 ¹²⁷	37.077 ³²²	61.73 ¹⁴⁴	50.77 ⁷⁷	6.06 ⁸⁴	24.603 ³⁵⁷	27.76 ¹³⁰
	338	73	310	128	76	18	350	73
19.7	13.335	48.84	37.387	63.01	51.53	5.88	24.953	27.03
17.7	13.655 ³²⁰	48.68 ¹⁶	37.681 ²⁹⁴	64.11 ¹¹⁰	52.27 ⁷⁴	6.40 ⁵²	25.288 ³³⁵	26.90 ¹³
11.7	13.961 ²⁹⁶	49.07 ³⁹	37.964 ²⁷³	64.99 ⁸⁸	52.96 ⁶⁹	7.57 ¹¹⁷	25.598 ³¹⁰	27.36 ⁴⁶
21.6	14.217 ²⁶⁸	49.99 ⁹²	38.202 ²⁴⁸	65.64 ⁶⁵	53.57 ⁶¹	9.32 ¹⁷⁵	25.881 ²⁸³	28.36 ¹⁰⁰
31.6	14.450 ²³³	51.38 ¹³⁹	38.424 ²²²	66.07 ⁴³	54.09 ⁵²	11.60 ²²⁸	26.128 ²⁴⁷	29.85 ¹⁴⁹
	196	179	196	21	41	269	210	190
10.6	14.646	53.17	38.620	66.28	54.50	14.29	26.338	31.75
20.6	14.806 ¹⁶⁰	55.27 ²¹⁰	38.787 ¹⁶⁷	66.30 ²	54.80 ³⁰	17.29 ³⁰⁰	26.509 ¹⁷¹	34.00 ²²⁶
30.5	14.927 ¹²¹	57.60 ²³³	38.927 ¹⁴⁰	66.16 ¹⁴	54.99 ¹⁹	20.49 ³²⁰	26.641 ¹³²	36.49 ²⁴⁹
10.5	15.009 ⁸²	60.06 ²⁴⁶	39.038 ¹¹¹	65.88 ²⁸	55.05 ⁶	23.76 ³²⁷	26.732 ⁹¹	39.13 ²⁶⁴
20.5	15.055 ⁴⁶	62.57 ²⁵¹	39.119 ⁸¹	65.50 ³⁸	54.99 ⁶	27.01 ³²⁵	26.782 ⁵⁰	41.81 ²⁶⁸
	8	247	53	46	19	311	10	268
30.4	15.063	65.04	39.172	65.04	54.80	30.12	26.792	44.46
9.4	15.035 ²⁸	67.40 ²³⁶	39.194 ²²	64.52 ⁵²	54.52 ²⁸	33.01 ²⁸⁹	26.763 ²⁹	46.98 ²⁵²
19.4	14.973 ⁶²	69.57 ²¹⁷	39.188 ⁶	63.97 ⁵⁵	54.14 ³⁸	35.58 ²⁵⁷	26.696 ⁶⁷	49.31 ²³³
29.4	14.890 ⁹³	71.50 ¹⁹³	39.151 ³⁷	63.41 ⁵⁶	53.67 ⁴⁷	37.78 ²²⁰	26.595 ¹⁰¹	51.39 ²⁰⁸
ly 9.3	14.755 ¹²⁵	73.13 ¹⁶³	39.088 ⁶³	62.83 ⁵⁸	53.11 ⁵⁶	39.55 ¹⁷⁷	26.462 ¹³³	53.16 ¹⁷⁷
	149	130	89	57	61	129	163	143
19.3	14.606	74.43	38.999	62.26	52.50	40.84	26.299	54.59
29.3	14.433 ¹⁷³	75.39 ⁹⁶	38.887 ¹¹²	61.71 ⁵⁵	51.84 ⁶⁶	41.62 ⁷⁸	26.113 ¹⁸⁶	55.63 ¹⁰⁴
8.3	14.244 ¹⁸⁹	75.95 ⁵⁶	38.757 ¹³⁰	61.18 ⁵³	51.16 ⁶⁸	41.89 ²⁷	25.907 ²⁰⁶	56.26 ⁶³
18.2	14.043 ²⁰¹	76.11 ¹⁶	38.614 ¹⁴³	60.68 ⁵⁰	50.45 ⁷¹	41.62 ²⁷	25.688 ²¹⁹	56.47 ²¹
28.2	13.838 ²⁰⁵	75.87 ²⁴	38.465 ¹⁴⁹	60.23 ⁴⁸	49.74 ⁷¹	40.83 ⁷⁹	25.464 ²²⁴	56.25 ²²
	202	64	147	39	69	139	222	64
7.2	13.636	75.23	38.318	59.84	49.05	39.54	25.242	55.61
17.1	13.446 ¹⁹⁰	74.18 ¹⁰⁵	38.180 ¹³⁸	59.54 ³⁰	48.39 ⁶⁶	37.75 ¹⁷⁹	25.032 ²¹⁰	54.53 ¹⁰⁸
27.1	13.278 ¹⁶⁸	72.75 ¹⁴³	38.061 ¹¹⁹	59.35 ¹⁹	47.79 ⁶⁰	35.51 ²²⁴	24.841 ¹⁹¹	53.05 ¹⁴⁸
t. 7.1	13.138 ¹⁴⁰	70.95 ¹⁸⁰	37.969 ⁹²	59.27 ⁸	47.27 ⁵²	32.84 ²⁶⁷	24.680 ¹⁶¹	51.18 ¹⁸⁷
17.1	13.036 ¹⁰²	68.79 ²¹⁶	37.913 ⁵⁶	59.36 ⁹	46.82 ⁴⁵	29.81 ³⁰³	24.557 ¹²³	48.94 ²²⁴
	56	248	14	27	34	333	77	257
27.0	12.980	66.31	37.899	59.63	46.48	26.48	24.480	46.37
v. 6.0	12.975 ⁵	63.58 ²⁷³	37.932 ³³	60.09 ⁴⁶	46.26 ²²	22.91 ³⁵⁷	24.456 ²⁴	43.53 ²⁶⁴
16.0	13.025 ⁵⁰	60.64 ²⁹⁴	38.016 ⁸⁴	60.78 ⁶⁹	46.17 ⁹	19.19 ³⁷²	24.488 ³²	40.45 ³⁰⁸
26.0	13.131 ¹⁰⁶	57.53 ³¹¹	38.150 ¹³⁴	61.68 ⁹⁰	46.21 ⁴	15.42 ³⁷⁷	24.581 ⁹⁸	37.24 ³²¹
c. 5.9	13.292 ¹⁶¹	54.37 ³¹⁶	38.332 ¹⁸²	62.79 ¹¹¹	46.39 ¹⁸	11.69 ³⁷³	24.730 ¹⁴⁹	33.96 ³²⁸
	213	314	226	129	30	357	203	325
15.9	13.505	51.23	38.558	64.08	46.69	8.12	24.933	30.71
25.9	13.763 ²⁵⁸	48.23 ³⁰⁰	38.821 ²⁶³	65.52 ¹⁴⁴	47.14 ⁴⁵	4.81 ³³¹	25.186 ²⁵³	27.59 ³¹²
35.8	14.058 ²⁹⁵	45.43 ²⁸⁰	39.111 ²⁹⁰	67.06 ¹⁵⁴	47.68 ⁵⁴	1.88 ²⁹³	25.480 ²⁹⁴	24.70 ²⁸⁹
Place	11.825	72.06	35.518	52.13	50.946	32.68	23.562	50.80
Tan δ	1.201	+0.665	1.013	-0.160	3.257	+3.100	1.263	+0.772
D_{α}	+0.05	+0.03	+0.06	-0.01	0.00	+0.13	+0.05	+0.03
D_{δ}	-0.3	-0.7	-0.3	-0.7	-0.3	-0.8	-0.3	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^1 Serpentis. Mag. 5.5			ϵ Draconis. Mag. 3.5			32 Libræ. Mag. 5.9			β Coronæ Borealis. Mag. 3.7		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "
	15	21	+15 42	15	23	+59 14	15	23	-16 25	15	24	+29 22
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.9	59.156		46.12	5.023		52.11	37.990		54.69	26.731		62.60
10.8	59.448 ²⁹²		43.81 ²³¹	5.433 ⁴¹⁰		49.32 ²⁷⁹	38.304 ³¹⁴		55.95 ¹²⁶	27.032 ³⁰¹		60.00 ²⁹⁹
20.8	59.758 ³¹⁰		41.73 ²⁰⁸	5.888 ⁴⁵⁵		47.03 ²²⁹	38.632 ³²⁸		57.29 ¹³⁴	27.353 ³²¹		57.73 ²²⁷
30.8	60.075 ³¹⁷		39.94 ¹⁷⁹	6.371 ⁴⁸³		45.32 ¹⁷¹	38.966 ³³⁴		58.67 ¹³⁸	27.687 ³³⁴		55.87 ¹⁹⁶
Feb. 9.8	60.393 ³¹⁸		38.50 ¹⁴⁴	6.868 ⁴⁹⁷		44.25 ¹⁰⁷	39.299 ³³³		60.02 ¹³⁵	28.022 ³³⁵		55.48 ¹³⁹
	308		108	491		40	323		128	328		55
19.7	60.701		37.47 ⁵⁹	7.359		43.85 ²⁷	39.622		61.30 ¹¹⁶	28.350		53.63 ³³
Mar. 1.7	60.996 ²⁹⁵		36.88 ¹⁶	7.833 ⁴⁷⁴		44.12 ⁹³	39.928 ³⁰⁶		62.46 ¹⁰³	28.663 ³¹³		53.30 ²²
11.7	61.270 ²⁷⁴		36.72 ²⁷	8.274 ⁴⁴¹		45.05 ¹⁵²	40.216 ²⁶⁴		63.49 ⁸⁷	28.956 ²⁶⁶		53.52 ⁷²
21.6	61.520 ²⁵⁰		36.99 ⁶⁶	8.670 ³⁹⁶		46.57 ²⁰⁶	40.480 ²⁴⁰		64.36 ⁷⁰	29.222 ²³⁶		54.24 ¹²⁹
31.6	61.743 ²²³		37.65 ¹⁰¹	9.013 ³⁴³		48.63 ²⁴⁹	40.720 ²¹²		65.06 ⁵⁵	29.458 ²⁰⁴		55.44 ¹³⁹
Apr. 10.6	61.937		38.66 ¹³⁰	9.296 ²¹⁷		51.12 ²⁸³	40.932		65.61 ³⁹	29.662		57.03 ¹⁹²
20.6	62.101 ¹⁶⁴		39.96 ¹⁵²	9.513 ¹⁴⁸		53.95 ³⁰⁶	41.118 ¹⁸⁶		66.00 ²⁴	29.831 ¹⁶⁹		58.95 ²¹⁶
30.6	62.236 ¹³⁵		41.48 ¹⁶⁹	9.681 ⁸⁰		57.01 ³¹⁷	41.275 ¹⁵⁷		66.24 ¹³	29.965 ¹³⁴		61.11 ²³²
May 10.5	62.339 ¹⁰³		43.17 ¹⁷⁷	9.741 ¹¹		60.18 ³¹⁹	41.402 ¹²⁷		66.37 ⁶	30.064 ⁹⁹		63.43 ²³⁹
20.5	62.411 ⁷²		44.94 ¹⁷⁹	9.752 ⁵⁶		63.37 ³⁰⁷	41.501 ⁹⁹		66.40 ²⁶	30.126 ⁶²		65.82 ²³⁸
30.5	62.452 ¹⁰		46.73 ¹⁷⁶	9.696 ¹¹⁸		66.44 ²⁹¹	41.568 ³⁵		66.34 ¹⁴	30.152 ⁸		68.20 ²²⁹
June 9.4	62.462 ²⁰		48.49 ¹⁵⁴	9.578 ¹⁷⁸		69.35 ²⁶²	41.603 ²⁵		66.20 ²⁰	30.144 ⁴¹		70.50 ²¹⁴
19.4	62.442 ⁴⁰		50.15 ¹⁰⁶	9.400 ²³¹		71.97 ²²³	41.608 ²⁷		66.00 ³⁰	30.103 ⁷⁵		72.64 ¹⁹⁸
29.4	62.393 ⁷⁹		51.69 ¹³⁶	9.169 ²⁷⁹		74.25 ¹⁹⁰	41.581 ⁵⁸		65.74 ²⁶	30.028 ¹⁰⁶		74.57 ¹⁶⁷
July 9.3	62.314 ¹⁰³		53.05 ¹¹⁴	8.890 ³²⁰		76.15 ¹⁴⁵	41.523 ⁸⁵		65.44 ³⁵	29.922 ¹³²		76.24 ¹³⁸
19.3	62.211 ¹²⁷		54.19 ⁹³	8.570 ³⁵²		77.60 ⁹⁶	41.438 ¹¹¹		65.09 ⁴⁰	29.790 ¹⁵⁷		77.62 ¹⁰⁶
29.3	62.084 ¹⁴⁴		55.12 ⁶⁷	8.218 ³⁷⁷		78.56 ⁴⁶	41.327 ¹³⁰		64.69 ⁴⁴	29.633 ¹⁷⁶		78.67 ⁶⁹
Aug. 8.3	61.940 ¹⁵⁸		55.79 ⁴¹	7.841 ³⁹⁰		79.02 ⁴	41.197 ¹⁴⁶		64.25 ⁴⁷	29.457 ¹⁸⁸		79.36 ³³
18.2	61.782 ¹⁶⁶		56.20 ¹³	7.451 ³⁹⁶		78.98 ⁵⁵	41.051 ¹⁵⁵		63.78 ⁴⁹	29.269 ¹⁹⁶		79.68 ⁴³
28.2	61.616 ¹⁶⁴		56.33 ¹⁶	7.055 ³⁸⁸		78.43 ¹⁰⁷	40.896 ¹⁵⁵		63.29 ⁵¹	29.073 ¹⁹⁵		79.63 ⁴³
Sept. 7.2	61.452		56.17 ⁴⁴	6.667		77.36 ¹⁵⁵	40.741		62.78 ⁵⁰	28.878		79.20 ⁸²
17.2	61.295 ¹⁵⁷		55.73 ⁷⁴	6.298 ³⁶⁹		75.81 ²⁰¹	40.595 ¹⁴⁶		62.28 ⁴⁶	28.692 ¹⁸⁶		78.38 ¹²⁰
27.1	61.156 ¹³⁹		54.99 ¹⁰⁴	5.960 ³³⁸		73.80 ²⁴⁴	40.467 ¹²⁸		61.82 ²⁹	28.525 ¹⁶⁷		77.18 ¹⁵⁷
Oct. 7.1	61.041 ¹¹⁵		53.95 ¹³¹	5.665 ²⁹⁵		71.36 ²⁸²	40.365 ¹⁰²		61.43 ²⁹	28.384 ¹⁴¹		75.61 ¹⁹⁹
17.1	60.961 ⁸⁰		52.64 ¹⁶¹	5.427 ¹⁷⁴		68.54 ³¹⁶	40.299 ⁶³		61.14 ¹⁶	28.280 ¹⁰⁴		73.72 ²³³
27.0	60.921		51.03 ¹⁸⁵	5.253 ¹⁰⁰		65.38 ³⁴³	40.276		60.98 ⁰	28.218		71.49 ²⁵¹
Nov. 6.0	60.927 ⁶		49.18 ²¹⁰	5.153 ²⁰		61.95 ³⁶¹	40.302 ²⁶		60.98 ²⁰	28.204 ¹⁴		68.98 ²⁷³
16.0	60.983 ⁵⁶		47.08 ²²⁸	5.133 ⁶⁶		58.34 ³⁷¹	40.379 ¹³⁰		61.18 ⁴¹	28.243 ³⁹		66.25 ²⁹⁰
26.0	61.089 ¹⁵⁶		44.80 ²⁴¹	5.199 ¹⁵¹		54.63 ³⁷¹	40.509 ¹⁸⁰		61.59 ⁶³	28.338 ¹⁴⁷		63.35 ³⁰⁰
Dec. 5.9	61.245 ²⁰²		42.39 ²⁴⁸	5.350 ²³⁴		50.92 ³⁵⁹	40.689 ²²⁶		62.22 ⁸³	28.485 ¹⁹⁸		60.35 ³⁰¹
15.9	61.447		39.91 ²⁴⁹	5.584 ³⁰⁸		47.33 ³³⁸	40.915 ²⁶⁵		63.05 ¹⁰²	28.683 ²⁴³		57.34 ²⁹²
25.9	61.689 ²⁷³		37.42 ²⁴⁰	5.892 ³⁷⁵		43.95 ³⁰⁴	41.180 ²⁹⁵		64.07 ¹¹⁹	28.926 ²⁷⁸		54.42 ²⁷⁶
35.9	61.962		35.02	6.267		40.91	41.475		65.26	29.204		51.66
Mean Place	59.103		55.98	6.326		70.30	37.733		53.38	26.896		75.59
Sec δ , Tan δ	1.039		+0.281	1.956		+1.681	1.043		-0.295	1.148		+0.563
$D\psi\alpha$, $D_\omega\alpha$	+0.06		+0.01	+0.03		+0.07	+0.07		-0.01	+0.05		+0.02
$D\psi\delta$, $D_\omega\delta$	-0.3		-0.8	-0.3		-0.8	-0.3		-0.8	-0.2		-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	γ Boötis. Mag. 5.2		γ Lupi (mean). Mag. 3.0		γ Libræ. Mag. 4.0		α Coronæ Borealis. Mag. 2.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 27	° ' " +41 6	h m 15 29	° ' " -40 53	h m 15 30	° ' " -14 31	h m 15 31	° ' " +26 59
	s 15 27	" +41 6	s 15 29	" -40 53	s 15 30	" -14 31	s 15 31	" +26 59
a. 0.9	58.568	27.85	40.410	27.71	56.431	2.19	12.772	11.48
10.8	58.887 319	25.07 278	40.790 380	27.93 22	56.738 307	3.49 130	13.066 294	8.90 258
20.8	59.235 348	22.71 236	41.193 403	28.45 52	57.060 322	4.85 136	13.381 315	6.63 227
30.8	59.599 364	20.84 187	41.604 411	29.24 79	57.389 329	6.22 137	13.708 327	4.73 190
b. 9.8	59.968 369	19.51 133	42.014 410	30.25 101	57.718 329	7.54 132	14.039 331	3.80 143
	364	73	400	122	321	122	325	94
19.7	60.332	18.78	42.414	31.47	58.039	8.76	14.364	2.36
ur. 1.7	60.681 349	18.66 12	42.799 385	32.83 136	58.345 306	9.86 110	14.674 310	1.96 40
11.7	61.008 327	19.15 49	43.161 362	34.30 147	58.633 288	10.81 95	14.967 293	2.07 11
21.7	61.304 296	20.19 104	43.497 336	35.85 155	58.899 266	11.57 76	15.233 266	2.68 61
31.6	61.566 262	21.76 157	43.802 305	37.44 159	59.142 243	12.16 59	15.473 240	3.76 108
	224	200	275	161	216	42	208	148
ur. 10.6	61.790	23.76	44.077	39.05	59.358	12.58	15.681	5.24
20.6	61.972 182	26.10 234	44.317 240	40.65 160	59.549 191	12.82 24	15.856 175	7.04 180
30.5	62.113 141	28.70 260	44.522 205	42.22 157	59.711 162	12.94 12	15.998 142	9.10 206
uy 10.5	62.210 97	31.45 275	44.688 166	43.74 152	59.845 134	12.93 1	16.105 107	11.32 222
20.5	62.264 54	34.26 281	44.816 128	45.18 144	59.948 103	12.83 10	16.177 72	13.63 231
	10	278	87	135	73	19	37	231
30.5	62.274	37.04	44.903	46.53	60.021	12.64	16.214	15.94
ne 9.4	62.244 30	39.68 264	44.949 46	47.75 122	60.063 42	12.38 26	16.218 4	18.18 224
19.4	62.173 71	42.14 246	44.954 5	48.82 107	60.073 10	12.08 30	16.187 31	20.28 210
29.4	62.064 109	44.32 218	44.916 38	49.73 91	60.051 22	11.73 35	16.123 64	22.20 192
ly 9.4	61.921 143	46.19 187	44.837 79	50.43 70	60.000 51	11.36 37	16.029 94	23.87 167
	174	151	115	49	82	41	123	140
19.3	61.747	47.70	44.722	50.92	59.918	10.95	15.906	25.27
29.3	61.546 201	48.80 110	44.573 149	51.15 23	59.810 108	10.52 43	15.759 147	26.35 108
ig. 8.3	61.325 221	49.48 68	44.397 176	51.13 2	59.681 129	10.08 44	15.591 168	27.09 74
18.2	61.090 235	49.73 25	44.202 195	50.84 29	59.537 144	9.61 47	15.409 182	27.48 39
28.2	60.848 242	49.52 21	43.996 206	50.29 55	59.382 155	9.14 47	15.219 190	27.52 4
	241	66	207	81	156	46	191	34
pt. 7.2	60.607	48.86	43.789	49.48	59.226	8.68	15.028	27.18
17.2	60.377 230	47.77 109	43.594 195	48.45 103	59.078 148	8.25 43	14.845 183	26.47 71
27.1	60.168 209	46.24 153	43.423 171	47.23 122	58.946 132	7.86 39	14.680 165	25.40 107
st. 7.1	59.988 180	44.30 194	43.286 137	45.87 136	58.840 106	7.56 30	14.540 140	23.97 143
17.1	59.846 142	42.00 230	43.194 92	44.42 145	58.769 71	7.37 19	14.434 106	22.20 177
	93	266	38	146	30	6	64	210
27.1	59.753	39.34	43.156	42.96	58.739	7.31	14.370	20.10
iv. 6.0	59.713 40	36.40 294	43.180 24	41.55 141	58.757 18	7.41 10	14.353 17	17.73 237
16.0	59.732 19	33.24 316	43.267 87	40.25 130	58.826 69	7.72 31	14.388 35	15.11 262
26.0	59.812 80	29.92 332	43.420 153	39.15 110	58.947 121	8.22 50	14.476 88	12.33 278
xc. 5.9	59.952 140	26.54 338	43.635 215	38.27 88	59.117 170	8.94 72	14.619 143	9.42 291
	200	334	271	59	217	91	192	263
15.9	60.152	23.20	43.906	37.68	59.334	9.85	14.811	6.49
25.9	60.402 250	19.98 322	44.226 320	37.39 29	59.591 257	10.94 109	15.045 234	3.62 287
35.9	60.698 296	17.02 296	44.586 360	37.40 1	59.877 286	12.17 123	15.318 273	0.90 272
n Place	59.037	42.99	40.217	32.30	56.209	0.44	12.931	23.59
δ, Tan δ	1.327	+0.873	1.323	-0.866	1.033	-0.259	1.122	+0.509
δ, D _a	+0.04	+0.04	+0.08	-0.04	+0.07	-0.01	+0.05	+0.02
δ, D _δ	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Cor. Bor. seq. Mag. 5.1		α Serpents. Mag. 2.8		β Serpents. Mag. 3.7		κ Serpents. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 36	° ' " +36 53	h m 15 40	° ' " + 6 40	h m 15 42	° ' " +15 40	h m 15 45	° ' " +18 23
	s 15 36	" +36 53	s 15 40	" + 6 40	s 15 42	" +15 40	s 15 45	" +18 23
Jan. 0.9	17.007	51.13	13.716	51.11	24.137	30.29	2.771	28.61
10.9	17.311 ³⁰⁴	48.36 ²⁷⁷	13.998 ²⁸²	49.07 ²⁰⁴	24.416 ²⁷⁹	27.96 ²³³	3.048 ²⁷⁷	26.20 ²⁴¹
20.8	17.641 ³³⁰	45.97 ²³⁹	14.299 ³⁰¹	47.15 ¹⁹²	24.717 ³⁰¹	25.85 ²¹¹	3.349 ³⁰¹	24.03 ²¹⁷
30.8	17.987 ³⁴⁶	44.03 ¹⁹⁴	14.609 ³¹⁰	45.44 ¹⁷¹	25.028 ³¹¹	24.01 ¹⁸⁴	3.681 ³¹²	22.15 ¹⁸⁶
Feb. 9.8	18.341 ³⁵⁴	42.62 ¹⁴¹	14.922 ³¹³	43.99 ¹⁴⁵	25.343 ³¹⁵	22.53 ¹⁴⁸	3.978 ³¹⁷	20.65 ¹⁵⁰
	348	86	306	112	311	108	312	107
19.7	18.689	41.76	15.228	42.87	25.654	21.45	4.290	19.58
Mar. 1.7	19.026 ³³⁷	41.49 ²⁷	15.524 ²⁹⁶	42.09 ⁷⁸	25.953 ²⁹⁹	20.80 ⁶⁵	4.592 ³⁰²	18.96 ⁶²
11.7	19.343 ³¹⁷	41.81 ³²	15.803 ²⁷⁹	41.67 ⁴²	26.236 ²⁸³	20.59 ²¹	4.878 ²⁸⁶	18.81 ¹⁵
21.7	19.633 ²⁹⁰	42.69 ⁸⁸	16.060 ²⁶⁷	41.62 ⁵	26.497 ²⁶¹	20.82 ²³	5.142 ²⁶⁴	19.11 ³⁰
31.6	19.892 ²⁵⁹	44.07 ¹³⁸	16.296 ²³⁶	41.92 ³⁰	26.736 ²³⁹	21.45 ⁶³	5.384 ²⁴²	19.84 ⁷³
	224	183	200	61	211	99	213	111
Apr. 10.6	20.116	45.90	16.505	42.53	26.947	22.44	5.597	20.95
20.6	20.303 ¹⁸⁷	48.08 ²¹⁸	16.688 ¹⁸³	43.40 ⁸⁷	27.131 ¹⁸⁴	23.75 ¹³¹	5.784 ¹⁸⁷	22.37 ¹⁴²
30.6	20.451 ¹⁴⁸	50.52 ²⁴⁴	16.843 ¹⁵⁵	44.48 ¹⁰⁸	27.284 ¹⁵³	25.30 ¹⁵⁵	5.939 ¹⁵⁵	24.05 ¹⁶⁶
May 10.5	20.559 ¹⁰⁸	53.15 ²⁶³	16.969 ¹²⁶	45.74 ¹²⁶	27.408 ¹²⁴	27.02 ¹⁷²	6.063 ¹²⁴	25.90 ¹⁸⁵
20.5	20.627 ⁶⁸	55.85 ²⁷⁰	17.067 ⁹⁸	47.09 ¹³⁵	27.501 ⁹³	28.84 ¹⁸²	6.157 ⁹⁴	27.85 ¹⁸⁶
	28	269	66	140	60	186	60	200
30.5	20.655	58.54	17.133	48.49	27.561	30.70	6.217	29.85
June 9.4	20.643 ¹²	61.12 ²⁵⁸	17.169 ³⁶	49.90 ¹⁴¹	27.589 ²⁸	32.53 ¹⁸³	6.244 ²⁷	31.81 ¹⁹⁶
19.4	20.594 ⁴⁹	63.54 ²⁴²	17.174 ⁵	51.27 ¹³⁷	27.586 ³	34.29 ¹⁷⁶	6.239 ⁵	33.69 ¹⁸⁸
29.4	20.507 ⁸⁷	65.72 ²¹⁸	17.147 ²⁷	52.55 ¹²⁸	27.550 ³⁶	35.91 ¹⁶²	6.201 ³⁸	35.43 ¹⁷⁴
July 9.4	20.385 ¹²²	67.62 ¹⁹⁰	17.090 ⁵⁷	53.72 ¹¹⁷	27.483 ⁶⁷	37.38 ¹⁴⁷	6.131 ⁷⁰	36.98 ¹⁵⁵
	152	155	84	104	95	125	98	123
19.3	20.233	69.17	17.006	54.76	27.388	38.63	6.033	38.31
29.3	20.055 ¹⁷⁸	70.35 ¹¹⁸	16.895 ¹¹¹	55.64 ⁸⁸	27.267 ¹²¹	39.67 ¹⁰⁴	5.908 ¹²⁵	39.40 ¹⁰⁰
Aug. 8.3	19.854 ²⁰¹	71.13 ⁷⁸	16.764 ¹³¹	56.34 ⁷⁰	27.126 ¹⁴¹	40.45 ⁷⁸	5.762 ¹⁴⁶	40.21 ⁸¹
18.3	19.637 ²¹⁷	71.50 ³⁷	16.617 ¹⁴⁷	56.86 ⁵²	26.966 ¹⁶⁰	40.99 ⁵⁴	5.598 ¹⁶⁴	40.75 ⁵⁴
28.2	19.412 ²²⁵	71.44 ⁶	16.459 ¹⁵⁸	57.17 ³¹	26.798 ¹⁶⁸	41.21 ²²	5.424 ¹⁷⁴	40.97 ²²
	225	48	160	11	172	4	177	7
Sept. 7.2	19.187	70.96	16.299	57.28	26.626	41.17	5.247	40.90
17.2	18.971 ²¹⁶	70.04 ⁹²	16.144 ¹⁵⁵	57.17 ¹¹	26.461 ¹⁶⁵	40.82 ³⁵	5.075 ¹⁷²	40.50 ⁴⁰
27.1	18.771 ²⁰⁰	68.71 ¹³³	16.003 ¹⁴¹	56.81 ³⁶	26.308 ¹⁵³	40.18 ⁶⁴	4.918 ¹⁵⁷	39.78 ⁷²
Oct. 7.1	18.600 ¹⁷¹	66.97 ¹⁷⁴	15.885 ¹¹⁸	56.22 ⁵⁹	26.180 ¹²⁸	39.25 ⁹³	4.782 ¹³⁶	38.75 ¹⁰³
17.1	18.464 ¹³⁶	64.86 ²¹¹	15.799 ⁸⁶	55.40 ⁸²	26.082 ⁹⁸	38.01 ¹²⁴	4.678 ¹⁰⁴	37.41 ¹³⁴
	92	246	48	108	59	152	64	164
27.1	18.372	62.40	15.751	54.32	26.023	36.49	4.614	35.77
Nov. 6.0	18.331 ⁴¹	59.66 ²⁷⁴	15.748 ³	53.01 ¹³¹	26.009 ¹⁴	34.71 ¹⁷⁸	4.594 ²⁰	33.87 ¹⁹⁰
16.0	18.346 ¹⁵	56.67 ²⁹⁹	15.793 ⁴⁵	51.46 ¹⁵⁵	26.044 ³⁵	32.67 ²⁰⁴	4.623 ²⁹	31.70 ²¹⁷
26.0	18.419 ⁷³	53.51 ³¹⁶	15.889 ⁹⁶	49.71 ¹⁷⁵	26.130 ⁸⁶	30.45 ²²²	4.704 ⁸¹	29.35 ²³⁵
Dec. 6.0	18.550 ¹³¹	50.26 ³²⁵	16.033 ¹⁴⁴	47.80 ¹⁹¹	26.266 ¹³⁶	28.07 ²³⁸	4.835 ¹³¹	26.85 ²⁵⁰
	188	324	189	204	183	246	179	260
15.9	18.738	47.02	16.222	45.76	26.449	25.61	5.014	24.25
25.9	18.973 ²³⁵	43.88 ³¹⁴	16.452 ²³⁰	43.67 ²⁰⁹	26.673 ²²⁴	23.14 ²⁴⁷	5.236 ²²²	21.68 ²⁵⁷
35.9	19.252 ²⁷⁹	40.95 ²⁹³	16.715 ²⁶³	41.59 ²⁰⁸	26.933 ²⁶⁰	20.73 ²⁴¹	5.493 ²⁵⁷	19.19 ²⁴⁹
Mean Place	17.411	64.95	13.655	58.05	24.182	39.29	2.863	38.11
Sec δ , Tan δ	1.250	+0.751	1.007	+0.117	1.039	+0.281	1.054	+0.332
$D\mu a$, $D_m a$	+0.04	+0.03	+0.06	0.00	+0.05	+0.01	+0.05	+0.01
$D\mu \delta$, $D_m \delta$	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	μ Serpentis. Mag. 3.6		12 H. Draconis. Mag. 5.1		ϵ Serpentis. Mag. 3.8		ζ Ursæ Minoris. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 45	° ' " - 3 10	h m 15 45	° ' " +62 50	h m 15 46	° ' " + 4 43	h m 15 46	° ' " +78 2
n. 0.9	20.448	52.90	22.91	52.71	43.664	19.66	51.85	32.85
10.9	20.732 ²⁸⁴	54.58 ¹⁶⁸	23.32 ⁴¹	49.77 ²⁹⁴	43.942 ²⁷⁸	17.69 ¹⁹⁷	52.60 ⁷⁵	30.05 ²⁸⁰
20.8	21.035 ³⁰³	56.21 ¹⁶³	23.78 ⁴⁶	47.30 ²⁴⁷	44.239 ²⁹⁷	15.83 ¹⁸⁶	53.48 ⁸⁸	27.75 ²³⁰
30.8	21.347 ³¹²	57.75 ¹⁵⁴	24.29 ⁵¹	45.40 ¹⁹⁰	44.549 ³¹⁰	14.16 ¹⁶⁷	54.48 ¹⁰⁰	26.01 ¹⁷⁴
ab. 9.8	21.662 ³¹⁵	59.12 ¹³⁷	24.83 ⁵⁴	44.11 ¹²⁹	44.861 ³¹²	12.73 ¹⁴³	55.55 ¹⁰⁷	24.91 ¹¹⁰
	310	115	54	62	306	114	109	42
19.7	21.972	60.27	25.37	43.49	45.167	11.59	56.64	24.49
ar. 1.7	22.269 ²⁹⁷	61.18 ⁹¹	25.90 ⁵³	43.56 ⁷	45.464 ²⁹⁷	10.79 ⁸⁰	57.72 ¹⁰⁸	24.75 ²⁶
11.7	22.553 ²⁸⁴	61.81 ⁶³	26.40 ⁵⁰	44.29 ⁷³	45.745 ²⁸¹	10.32 ⁴⁷	58.74 ¹⁰²	25.67 ⁹²
21.7	22.815 ²⁶²	62.18 ³⁷	26.86 ⁴⁶	45.66 ¹³⁷	46.006 ²⁶¹	10.21 ¹¹	59.68 ⁹⁴	27.20 ¹⁵³
31.6	23.057 ²⁴²	62.26 ⁸	27.27 ⁴¹	47.60 ¹⁹⁴	46.246 ²⁴⁰	10.44 ²³	60.50 ⁸²	29.28 ²⁰⁸
	217	17	33	239	215	52	68	253
pr. 10.6	23.274	62.09	27.60	49.99	46.461	10.96	61.18	31.81
20.6	23.466 ¹⁹²	61.71 ³⁸	27.88 ²⁸	52.76 ²⁷⁷	46.650 ¹⁸⁹	11.75 ⁷⁹	61.70 ⁵²	34.69 ²⁸⁸
30.6	23.631 ¹⁶⁵	61.15 ⁵⁶	28.08 ²⁰	55.83 ³⁰⁷	46.812 ¹⁶²	12.75 ¹⁰⁰	62.03 ³³	37.83 ³¹⁴
ay 10.5	23.769 ¹³⁸	60.43 ⁷²	28.20 ¹²	59.05 ³²²	46.947 ¹³⁵	13.91 ¹¹⁶	62.19 ¹⁶	41.09 ³²⁶
20.5	23.877 ¹⁰⁸	59.61 ⁸²	28.25 ⁵	62.32 ³²⁷	47.051 ¹⁰⁴	15.18 ¹²⁷	62.17 ²	44.38 ³²⁹
	79	88	3	321	73	132	21	319
30.5	23.956 ⁴⁸	58.73 ⁹⁰	28.22 ¹²	65.53 ³⁰⁶	47.124 ⁴⁴	16.50 ¹³³	61.96 ³⁷	47.57 ³⁰²
ne 9.4	24.004 ¹⁶	57.83 ⁹¹	28.10 ¹⁸	68.59 ²⁸⁴	47.168 ¹²	17.83 ¹²⁹	61.59 ⁵⁴	50.59 ²⁷⁶
19.4	24.020 ¹⁶	56.92 ⁸⁸	27.92 ²⁴	71.43 ²⁵⁰	47.180 ²¹	19.12 ¹²³	61.05 ⁶⁸	53.35 ²⁴¹
29.4	24.004 ⁴⁶	56.04 ⁸³	27.68 ³¹	73.93 ²¹³	47.159 ⁵⁰	20.35 ¹¹³	60.37 ⁸¹	55.76 ²⁰¹
ly 9.4	23.958 ⁷⁶	55.21 ⁷⁷	27.37 ³⁵	76.06 ¹⁷⁰	47.109 ⁸⁰	21.48 ¹⁰¹	59.56 ⁹¹	57.77 ¹⁵⁷
19.3	23.882	54.44	27.02	77.76	47.029	22.49	58.65	59.34
29.3	23.780 ¹⁰²	53.76 ⁶⁸	26.62 ⁴⁰	78.99 ¹²³	46.922 ¹⁰⁷	23.36 ⁸⁷	57.64 ¹⁰¹	60.42 ¹⁰⁸
ag. 8.3	23.655 ¹²⁵	53.17 ⁵⁹	26.19 ⁴³	79.73 ⁷⁴	46.794 ¹²⁸	24.06 ⁷⁰	56.58 ¹⁰⁶	60.99 ⁵⁷
18.3	23.513 ¹⁴²	52.66 ⁵¹	25.74 ⁴⁵	79.95 ²²	46.649 ¹⁴⁵	24.59 ⁵³	55.48 ¹¹⁰	61.04 ⁵
28.2	23.359 ¹⁵⁴	52.29 ³⁷	25.28 ⁴⁶	79.65 ³⁰	46.492 ¹⁵⁷	24.94 ³⁵	54.37 ¹¹¹	60.56 ⁴⁸
	158	28	46	81	161	15	110	99
pt. 7.2	23.201	52.01	24.82	78.84	46.331	25.09	53.27	59.57
17.2	23.048 ¹⁵³	51.86 ¹⁵	24.37 ⁴⁵	77.52 ¹³²	46.175 ¹⁵⁶	25.05 ⁴	52.20 ¹⁰⁷	58.09 ¹⁴⁸
27.1	22.909 ¹³⁹	51.87 ¹	23.95 ⁴²	75.71 ¹⁸¹	46.031 ¹⁴⁴	24.78 ²⁷	51.21 ⁹⁹	56.14 ¹⁹⁵
st. 7.1	22.793 ¹¹⁶	52.05 ¹⁸	23.58 ³⁷	73.45 ²²⁶	45.911 ¹²⁰	24.30 ⁴⁸	50.30 ⁹¹	53.75 ²³⁹
17.1	22.708 ⁸⁵	52.40 ³⁵	23.26 ³²	70.78 ²⁶⁷	45.820 ⁹¹	23.58 ⁷²	49.50 ⁸⁰	50.97 ²⁷⁸
	47	54	25	304	52	96	64	312
27.1	22.661 ¹	52.94 ⁷⁶	23.01 ¹⁸	67.74 ³³³	45.768 ⁷	22.62 ¹¹⁹	48.86 ⁵⁰	47.85 ³³⁹
iv. 6.0	22.660 ⁴⁸	53.70 ⁹⁶	22.83 ⁷	64.41 ³⁵⁷	45.761 ⁴⁰	21.43 ¹⁴¹	48.36 ³²	44.46 ³⁵⁹
16.0	22.708 ¹⁴⁷	54.66 ¹¹⁷	22.76 ¹	60.84 ³⁶⁹	45.801 ⁹⁰	20.02 ¹⁶³	48.04 ¹¹	40.87 ³⁶⁸
26.0	22.805 ¹⁹⁷	55.83 ¹³⁴	22.77 ¹⁰	57.15 ³⁷³	45.891 ¹³⁹	18.39 ¹⁷⁹	47.93 ⁸	37.19 ³⁶⁹
sc. 6.0	22.952 ¹⁹²	57.17 ¹⁴⁹	22.87 ²⁰	53.42 ³⁶⁶	46.030 ¹⁸⁶	16.60 ¹⁹¹	48.01 ²⁸	33.50 ³⁵⁹
15.9	23.144 ²³¹	58.66 ¹⁶²	23.07 ²⁸	49.76 ³⁴⁷	46.216 ²²⁵	14.69 ¹⁹⁹	48.29 ⁴⁷	29.91 ³³⁸
25.9	23.375 ²⁶⁴	60.28 ¹⁶⁷	23.35 ³⁸	46.29 ³¹⁸	46.441 ²⁵⁹	12.70 ¹⁹⁹	48.76 ⁶⁵	26.53 ³⁰⁴
35.9	23.639	61.95	23.73	43.11	46.700	10.71	49.41	23.49
1 Place	20.334	48.52	24.776	69.48	43.613	25.91	57.492	50.37
2, Tan δ	1.002	-0.056	2.191	+1.950	1.003	+0.083	4.828	+4.723
, D ₀ α	+0.06	0.00	+0.02	+0.07	+0.06	0.00	-0.04	+0.17
, D ₀ δ	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Triang. Aust. Mag. 3.0		λ Libræ. Mag. 5.1		γ Serpentis. Mag. 3.9		π Scorpii. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 47	° ' " -63 10	h m 15 48	° ' " -19 55	h m 15 52	° ' " +15 55	h m 15 53	° ' " -25 52
Jan. 0.9	53.92	36.22	34.390	23.22	39.783	33.78	53.410	43.56
10.9	54.50 ⁵⁸	35.33 ⁸⁹	34.696 ³⁰⁶	24.19 ⁹⁷	40.056 ²⁷³	31.41 ²³⁷	53.725 ³¹⁵	44.23 ⁶⁷
20.8	55.10 ⁶⁰	34.87 ⁴⁶	35.020 ³²⁴	25.26 ¹⁰⁷	40.351 ²⁹⁶	29.25 ²¹⁶	54.059 ³³⁴	45.05 ⁸²
30.8	55.73 ⁶³	34.84 ³	35.355 ³³⁵	26.40 ¹¹⁴	40.660 ³⁰⁹	27.36 ¹⁸⁹	54.407 ³⁴⁸	45.98 ⁹²
Feb. 9.8	56.38 ⁶⁵	35.23 ³⁹	35.692 ³³⁷	27.56 ¹¹⁶	40.974 ³¹⁴	25.82 ¹⁵⁴	54.757 ³⁵⁰	47.00 ¹⁰²
19.7	57.02 ⁶⁴	36.02 ⁷⁹	36.024 ³³²	28.68 ¹¹²	41.285 ³¹¹	24.67 ¹¹⁵	55.103 ³⁴⁶	48.05 ¹⁰⁵
Mar. 1.7	57.64 ⁶²	37.17 ¹¹⁵	36.344 ³²⁰	29.73 ¹⁰⁵	41.586 ³⁰¹	23.96 ⁷¹	55.438 ³³⁵	49.10 ¹⁰⁵
11.7	58.22 ⁵⁸	38.64 ¹⁴⁷	36.648 ³⁰⁴	30.69 ⁹⁶	41.874 ²⁸⁸	23.70 ²⁶	55.758 ³²⁰	50.12 ¹⁰²
21.7	58.78 ⁵⁶	40.40 ¹⁷⁸	36.934 ²⁸⁶	31.53 ⁸⁴	42.141 ²⁶⁷	23.88 ¹⁸	56.058 ³⁰⁰	51.08 ⁹⁶
31.6	59.30 ⁵²	42.40 ²⁰⁰	37.196 ²⁶²	32.23 ⁷⁰	42.386 ²⁴⁵	24.46 ⁵⁸	56.337 ²⁷⁹	51.96 ⁸⁸
Apr. 10.6	59.78 ⁴⁶	44.60 ²²⁰	37.435 ²³⁹	32.82 ⁵⁹	42.605 ²¹⁹	25.42 ⁹⁶	56.590 ²⁵³	52.77 ⁸¹
20.6	60.17 ⁴¹	46.93 ²³³	37.647 ²¹²	33.28 ⁴⁶	42.798 ¹⁹³	26.71 ¹²⁹	56.818 ²²⁸	53.49 ⁷²
30.6	60.52 ³⁵	49.38 ²⁴⁵	37.833 ¹⁸⁶	33.63 ³⁵	42.961 ¹⁶³	28.23 ¹⁵²	57.016 ¹⁹⁸	54.14 ⁶⁵
May 10.5	60.81 ²⁹	51.88 ²⁵⁰	37.988 ¹⁵⁵	33.87 ²⁴	43.095 ¹³⁴	29.95 ¹⁷²	57.185 ¹⁶⁹	54.71 ⁵⁷
20.5	61.03 ²²	54.38 ²⁵⁰	38.113 ¹²⁵	34.03 ¹⁶	43.197 ¹⁰²	31.77 ¹⁸²	57.323 ¹³⁸	55.20 ⁴⁹
30.5	61.17 ¹⁴	56.83 ²⁴⁵	38.208 ⁹⁵	34.12 ⁹	43.267 ⁷⁰	33.64 ¹⁸⁷	57.427 ¹⁰⁴	55.63 ⁴³
June 9.4	61.22 ⁵	59.19 ²³⁶	38.268 ⁶⁰	34.15 ³	43.305 ³⁸	35.50 ¹⁸⁶	57.495 ⁶⁸	55.99 ³⁶
19.4	61.22 ⁰	61.37 ²¹⁸	38.294 ²⁶	34.12 ³	43.310 ⁵	37.28 ¹⁷⁸	57.528 ³³	56.28 ²⁹
29.4	61.14 ⁸	63.35 ¹⁹⁸	38.236 ⁸	34.03 ⁹	43.282 ²⁸	38.93 ¹⁰⁵	57.525 ³	56.50 ²²
July 9.4	60.98 ¹⁶	65.04 ¹⁶⁹	38.245 ⁴¹	33.89 ¹⁴	43.222 ⁶⁰	40.42 ¹⁴⁹	57.485 ⁴⁰	56.63 ¹³
19.3	60.77 ²¹	66.44 ¹⁴⁰	38.171 ⁷⁴	33.69 ²⁰	43.133 ⁸⁹	41.71 ¹²⁹	57.410 ⁷⁵	56.66 ³
29.3	60.48 ²⁹	67.45 ¹⁰¹	38.069 ¹⁰²	33.43 ²⁶	43.016 ¹¹⁷	42.77 ¹⁰⁶	57.304 ¹⁰⁶	56.59 ⁷
Aug. 8.3	60.15 ³³	68.07 ⁶²	37.940 ¹²⁹	33.11 ³²	42.877 ¹³⁹	43.57 ⁸⁰	57.171 ¹³³	56.42 ¹⁷
18.3	59.79 ³⁶	68.25 ¹⁸	37.792 ¹⁴⁸	32.73 ³⁸	42.718 ¹⁵⁹	44.11 ⁵⁴	57.017 ¹⁵⁴	56.13 ²⁹
28.2	59.40 ³⁹	68.00 ²⁵	37.632 ¹⁶⁰	32.90 ⁴³	42.549 ¹⁶⁹	44.37 ²⁶	56.847 ¹⁷⁰	55.72 ⁴¹
Sept. 7.2	59.02 ³⁸	67.29 ⁷¹	37.467 ¹⁶⁵	31.83 ⁴⁷	42.374 ¹⁷⁵	44.34 ³	56.673 ¹⁷⁴	55.20 ⁵²
17.2	58.65 ³⁷	66.16 ¹¹³	37.305 ¹⁶²	31.32 ⁵¹	42.203 ¹⁷¹	44.01 ³³	56.502 ¹⁷¹	54.60 ⁶⁰
27.1	58.31 ³⁴	64.64 ¹⁵²	37.159 ¹⁴⁶	30.80 ⁵²	42.046 ¹⁵⁷	43.38 ⁶³	56.348 ¹⁵⁴	53.94 ⁶⁶
Oct. 7.1	58.04 ²⁷	62.79 ¹⁸⁵	37.038 ¹²¹	30.30 ⁵⁰	41.910 ¹³⁶	42.45 ⁹³	56.217 ¹³¹	53.22 ⁷²
17.1	57.82 ²²	60.64 ²¹⁵	36.950 ⁸⁸	29.86 ⁴⁴	41.804 ¹⁰⁶	41.21 ¹²⁴	56.120 ⁹⁷	52.53 ⁶⁹
27.1	57.69 ¹³	58.32 ²³²	36.904 ⁴⁶	29.51 ³⁵	41.736 ⁶⁸	39.69 ¹⁵²	56.065 ⁵⁵	51.87 ⁶⁶
Nov. 6.0	57.66 ³	55.90 ²⁴²	36.906 ²	29.29 ²²	41.712 ²⁴	37.90 ¹⁷⁹	56.065 ⁰	51.29 ⁵⁸
16.0	57.74 ⁸	53.47 ²⁴³	36.960 ⁵⁴	29.22 ⁷	41.736 ²⁴	35.86 ²⁰⁴	56.117 ⁵²	50.85 ⁴⁴
26.0	57.91 ¹⁷	51.13 ²³⁴	37.067 ¹⁰⁷	29.33 ¹¹	41.811 ⁷⁵	33.62 ²²⁴	56.223 ¹⁰⁶	50.59 ²⁶
Dec. 6.0	58.19 ²⁸	48.99 ²¹⁴	37.226 ¹⁵⁹	29.65 ³²	41.937 ¹²⁶	31.22 ²⁴⁰	56.384 ¹⁶¹	50.50 ⁹
15.9	58.56 ³⁷	47.11 ¹⁸⁸	37.434 ²⁰⁸	30.16 ⁵¹	42.111 ¹⁷⁴	28.73 ²⁴⁹	56.596 ²¹²	50.64 ¹⁴
25.9	59.01 ⁴⁵	45.57 ¹⁵⁴	37.685 ²⁵¹	30.87 ⁷¹	42.327 ²¹⁶	26.23 ²⁵⁰	56.853 ²⁵⁷	50.98 ³⁴
35.9	59.53 ⁵²	44.42 ¹¹⁵	37.968 ²⁸³	31.75 ⁸⁸	42.580 ²⁵³	23.78 ²⁴⁵	57.146 ²⁹³	51.52 ⁵⁴
Mean Place	54.265	44.26	34.228	22.94	39.876	42.38	53.266	44.63
Sec δ , Tan δ	2.216	-1.978	1.064	-0.362	1.040	+0.285	1.111	-0.485
$D\mu a$, $D\omega a$	+0.10	-0.07	+0.07	-0.01	+0.05	+0.01	+0.07	-0.02
$D\mu \delta$, $D\omega \delta$	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8	-0.2	-0.9

APPARENT PLACES OF STARS, 1918.

443

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	ϵ Coronæ Borealis. Mag. 4.2		δ Scorpii. Mag. 2.5		θ Draconis. Mag. 4.1		β Scorpii. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 54	° ' " +27 6	h m 15 55	° ' " -22 23	h m 16 0	° ' " +58 46	h m 16 0	° ' " -19 34
n. 0.9	11.212	41.51	29.012	21.30	19.469	46.99	40.041	55.33
10.9	11.487 275	38.88 263	29.318 306	22.11 81	19.823 354	43.95 304	40.337 296	56.23 90
20.8	11.790 303	36.51 237	29.643 325	23.05 94	20.232 409	41.33 262	40.654 317	57.24 101
30.8	12.108 318	34.52 199	29.981 338	24.07 102	20.681 449	39.25 208	40.983 329	58.30 106
ob. 9.8	12.433 325	32.97 155	30.322 341	25.13 106	21.154 473	37.76 149	41.319 336	59.37 107
	325	106	338	106	483	82	331	106
19.8	12.758	31.91	30.660	26.19	21.636	36.94	41.650	60.42
ar. 1.7	13.074 316	31.37 54	30.987 327	27.21 102	22.113 477	36.78 16	41.973 323	61.39 97
11.7	13.373 299	31.38 1	31.299 312	28.16 95	22.571 458	37.31 53	42.280 307	62.26 87
21.7	13.654 281	31.89 51	31.593 294	29.02 86	22.998 427	38.46 115	42.571 291	63.01 76
31.6	13.908 254	32.89 100	31.865 272	29.78 76	23.381 383	40.21 175	42.841 270	63.64 63
	228	141	248	64	332	224	247	50
or. 10.6	14.136	34.30	32.113	30.42	23.713	42.45	43.088	64.14
20.6	14.332 196	36.09 179	32.335 222	30.97 55	23.986 273	45.12 267	43.310 222	64.52 38
30.6	14.496 164	38.15 206	32.531 196	31.42 45	24.197 211	48.09 297	43.507 197	64.78 26
ay 10.5	14.626 130	40.40 225	32.697 166	31.78 36	24.340 143	51.26 317	43.675 168	64.96 18
20.5	14.723 97	42.77 237	32.833 136	32.07 29	24.417 77	54.52 326	43.813 138	65.06 10
	60	240	105	21	9	325	106	4
30.5	14.783	45.17	32.938	32.28	24.426	57.77	43.919	65.10
me 9.5	14.807 24	47.52 235	33.005 67	32.44 16	24.368 58	60.91 314	43.991 72	65.09 1
19.4	14.794 13	49.77 225	33.038 33	32.54 10	24.247 121	63.84 293	44.028 37	65.03 6
29.4	14.748 46	51.83 206	33.036 2	32.58 4	24.065 182	66.49 265	44.031 3	64.92 11
dy 9.4	14.687 81	53.67 184	32.998 38	32.55 3	23.827 238	68.81 232	43.997 34	64.77 15
	112	156	71	9	287	191	67	19
19.3	14.555	55.23	32.927	32.46	23.540	70.72	43.930	64.58
29.3	14.415 140	56.49 126	32.825 102	32.29 17	23.211 329	72.18 146	43.834 96	64.33 25
ug. 8.3	14.249 166	57.43 94	32.696 129	32.03 26	22.847 364	73.17 99	43.708 126	64.04 29
18.3	14.067 182	58.01 58	32.546 150	31.71 32	22.458 389	73.66 49	43.562 146	63.70 34
28.2	13.873 194	58.22 21	32.381 165	31.30 41	22.064 404	73.63 3	43.401 161	63.31 39
	199	16	169	48	407	54	168	44
pt. 7.2	13.674	58.06	32.212	30.82	21.647	73.09	43.233	62.87
17.2	13.479 195	57.53 53	32.047 165	30.29 53	21.250 397	72.04 106	43.070 163	62.40 47
27.2	13.297 182	56.63 90	31.894 153	29.72 57	20.874 376	70.51 153	42.917 153	61.93 47
st. 7.1	13.139 158	55.34 129	31.766 128	29.15 57	20.532 342	68.50 201	42.788 129	61.48 45
17.1	13.012 127	53.70 164	31.671 95	28.60 55	20.237 295	66.06 244	42.690 98	61.07 41
	88	197	53	48	235	282	56	33
27.1	12.924	51.73	31.618	28.12	20.002	63.24	42.634	60.74
iv. 6.0	12.882 42	49.47 226	31.614 4	27.75 37	19.834 168	60.08 316	42.623 11	60.53 21
16.0	12.891 9	46.93 254	31.663 49	27.53 22	19.744 90	56.65 343	42.665 42	60.46 7
26.0	12.954 63	44.20 273	31.765 102	27.47 6	19.736 8	53.06 359	42.761 96	60.57 11
sc. 6.0	13.069 115	41.34 286	31.921 156	27.62 15	19.814 78	49.38 368	42.908 147	60.86 29
	167	293	205	33	161	365	196	48
15.9	13.236	38.41	32.126	27.95	19.975	45.73	43.104	61.34
25.9	13.450 214	35.52 289	32.374 248	28.48 53	20.217 242	42.22 351	43.342 238	62.01 67
35.9	13.703 253	32.75 277	32.657 283	29.19 71	20.530 313	38.96 326	43.617 275	62.83 82
n Place	11.491	52.38	28.874	21.59	21.100	62.13	39.924	55.00
δ , Tan δ	1.123	+0.512	1.082	-0.412	1.929	+1.650	1.062	-0.356
δ , D α	+0.05	+0.02	+0.07	-0.01	+0.02	+0.06	+0.07	-0.01
δ , D δ	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Herculis. Mag. 5.3		Groombridge 2320. Mag. 5.4		ϕ Herculis. Mag. 4.3		δ^1 Apodis. Mag. 4.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 4	" ' +17 15	h m 16 6	" ' +68 1	h m 16 6	" ' +45 8	h m 16 8	" ' —
Jan. 0.9	22.179	43.39	2.80	18.15	10.296	44.55	0.34	21.
10.9	22.443 ²⁶⁴	41.00 ²³⁹	3.23 ⁴³	15.08 ³⁰⁷	10.588 ²⁹²	41.56 ²⁹⁹	1.45 ¹¹¹	19.
20.8	22.732 ²⁸⁹	38.81 ²¹⁹	3.74 ⁵¹	12.47 ²⁶¹	10.918 ³³⁰	38.93 ²⁶³	2.67 ¹²²	18.
30.8	23.037 ³⁰⁵	36.92 ¹⁸⁹	4.31 ⁵⁷	10.40 ²⁰⁷	11.276 ³⁵⁸	36.76 ²¹⁷	3.97 ¹³⁰	17.
Feb. 9.8	23.347 ³¹⁰	35.38 ¹⁵⁴	4.93 ⁶²	8.94 ¹⁴⁶	11.650 ³⁷⁴	35.13 ¹⁶³	5.32 ¹³⁵	17.
	311	113	63	79	379	102	137	
19.8	23.658	34.25	5.56	8.15	12.029	34.11	6.69	17.
Mar. 1.7	23.962 ³⁰⁴	33.55 ⁷⁰	6.19 ⁶³	8.03 ¹²	12.403 ³⁷⁴	33.72 ³⁹	8.04 ¹³⁵	18.
11.7	24.252 ²⁹⁰	33.32 ²³	6.80 ⁶¹	8.59 ⁵⁶	12.763 ³⁶⁰	33.96 ²⁴	9.36 ¹³²	19.
21.7	24.525 ²⁷³	33.54 ²²	7.38 ⁵⁸	9.81 ¹²²	13.100 ³³⁷	34.80 ⁸⁴	10.61 ¹²⁵	20.
31.6	24.778 ²⁵³	34.19 ⁶⁵	7.89 ⁵¹	11.61 ¹⁸⁰	13.407 ³⁰⁷	36.23 ¹⁴³	11.77 ¹¹⁶	22.
	229	104	44	232	272	191	106	
Apr. 10.6	25.007	35.23	8.33	13.93	13.679	38.14	12.83	25.
20.6	25.209 ²⁰²	36.60 ¹³⁷	8.69 ³⁶	16.66 ²⁷³	13.913 ²³⁴	40.47 ²³³	13.78 ⁹⁵	27.
30.6	25.383 ¹⁷⁴	38.23 ¹⁶³	8.96 ²⁷	19.69 ³⁰³	14.102 ¹⁸⁹	43.12 ²⁶⁵	14.58 ⁸⁰	30.
May 10.5	25.528 ¹⁴⁵	40.06 ¹⁸³	9.14 ¹⁸	22.93 ³²⁴	14.246 ¹⁴⁴	46.00 ²⁸⁸	15.22 ⁶⁴	33.
20.5	25.639 ¹¹¹	42.01 ¹⁹⁵	9.22 ⁸	26.25 ³³²	14.343 ⁹⁷	48.99 ²⁹⁹	15.71 ⁴⁹	36.
	80	201	2	332	50	302	32	
30.5	25.719	44.02	9.20	29.57	14.393	52.01	16.03	39.
June 9.5	25.766 ⁴⁷	46.01 ¹⁹⁹	9.08 ¹²	32.77 ³²⁰	14.395 ²	54.97 ²⁹⁶	16.16 ¹³	42.
19.4	25.777 ¹¹	47.93 ¹⁹²	8.88 ²⁰	35.75 ²⁹⁸	14.350 ⁴⁵	57.77 ²⁸⁰	16.12 ⁴	44.
29.4	25.756 ²¹	49.72 ¹⁷⁹	8.59 ²⁹	38.45 ²⁷⁰	14.260 ⁹⁰	60.33 ²⁵⁶	15.89 ²³	47.
July 9.4	25.702 ⁵⁴	51.35 ¹⁶³	8.22 ³⁷	40.80 ²³⁵	14.127 ¹³³	62.61 ²²⁸	15.51 ³⁸	49.
	86	142	43	193	172	192	54	
19.3	25.616	52.77	7.79	42.73	13.955	64.53	14.97	51.
29.3	25.499 ¹¹⁷	53.95 ¹¹⁸	7.30 ⁴⁹	44.19 ¹⁴⁶	13.748 ²⁰⁷	66.06 ¹⁵³	14.29 ⁶⁸	53.
Aug. 8.3	25.359 ¹⁴⁰	54.87 ⁹²	6.76 ⁵⁴	45.17 ⁹⁸	13.512 ²³⁶	67.15 ¹⁰⁹	13.49 ⁸⁰	54.
18.3	25.199 ¹⁶⁰	55.52 ⁶⁵	6.19 ⁵⁷	45.64 ⁴⁷	13.253 ²⁵⁹	67.80 ⁶⁵	12.61 ⁸⁸	55.
28.2	25.025 ¹⁷⁴	55.88 ³⁶	5.60 ⁵⁹	45.60 ⁴	12.980 ²⁷³	67.98 ¹⁸	11.67 ⁹⁴	55.
	180	5	60	57	279	29	95	
Sept. 7.2	24.845	55.93	5.00	45.03	12.701	67.69	10.72	55.
17.2	24.668 ¹⁷⁷	55.68 ²⁵	4.42 ⁵⁸	43.92 ¹¹¹	12.426 ²⁷⁵	66.92 ⁷⁷	9.79 ⁹³	54.
27.2	24.500 ¹⁶⁸	55.11 ⁵⁷	3.87 ⁵⁵	42.34 ¹⁵⁸	12.167 ²⁵⁹	65.69 ¹²³	8.92 ⁸⁷	52.
Oct. 7.1	24.353 ¹⁴⁷	54.21 ⁹⁰	3.36 ⁵¹	40.27 ²⁰⁷	11.931 ²³⁶	64.00 ¹⁶⁹	8.17 ⁷⁵	50.
17.1	24.237 ¹¹⁶	53.01 ¹³⁰	2.91 ⁴⁵	37.77 ²⁵⁰	11.731 ²⁰⁰	61.90 ²¹⁰	7.55 ⁶²	48.
	81	149	37	289	155	249	45	
27.1	24.156	51.52	2.54	34.88	11.576	59.41	7.10	45.
Nov. 6.0	24.118 ³⁸	49.75 ¹⁷⁷	2.26 ²⁸	31.65 ³²³	11.473 ¹⁰³	56.59 ²⁸²	6.87 ²³	42.
16.0	24.129 ¹¹	47.72 ²⁰³	2.08 ¹⁸	28.16 ³⁴⁹	11.432 ⁴¹	53.48 ³¹¹	6.84 ³	39.
26.0	24.190 ⁶¹	45.48 ²²⁴	2.01 ⁷	24.52 ³⁶⁴	11.453 ²¹	50.17 ³³¹	7.04 ²⁰	36.
Dec. 6.0	24.303 ¹¹³	43.08 ²⁴⁰	2.06 ⁵	20.80 ³⁷²	11.540 ⁸⁷	46.73 ³⁴⁴	7.46 ⁴²	33.
	161	250	16	367	149	346	65	
15.9	24.464	40.58	2.22	17.13	11.689	43.27	8.11	31.
25.9	24.668 ²⁰⁴	38.06 ²⁵²	2.49 ²⁷	13.58 ³⁵⁵	11.898 ²⁰⁹	39.89 ³³⁸	8.94 ⁸³	28.
35.9	24.910 ²⁴²	35.60 ²⁴⁶	2.86 ³⁷	10.30 ³²⁸	12.160 ²⁶²	36.73 ³¹⁶	9.93 ⁹⁹	26.
Mean Place	22.342	51.73	5.626	33.49	11.154	57.61	2.583	29
Sec δ , Tan δ	1.047	+0.311	2.672	+2.478	1.418	+1.005	5.012	-4
$D\phi\alpha$, $D\omega\alpha$	+0.05	+0.01	0.00	+0.08	+0.04	+0.03	+0.18	-0
$D\phi\delta$, $D\omega\delta$	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	δ Ophiuchi. Mag. 3.0		σ Cor. Bor. seq. Mag. 5.8		19 Ursæ Minoris. Mag. 5.5		γ^2 Normæ. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 10	° ' " — 3 29	h m 16 11	° ' " +34 3	h m 16 13	° ' " +76 4	h m 16 13	° ' " —49 57
	s 2.820	" 6.34	s 35.912	" 46.18	s 3.46	" 49.07	s 41.554	" 14.95
a. 0.9	2.820	6.34	35.912	46.18	3.46	49.07	41.554	14.95
10.9	3.088 ²⁶⁸	7.93 ¹⁵⁹	36.179 ²⁶⁷	43.33 ²⁸⁵	4.05 ⁵⁹	46.04 ³⁰³	41.961 ³⁹⁷	14.32 ⁶³
20.8	3.378 ²⁹⁰	9.48 ¹⁵⁵	36.479 ³⁰⁰	40.79 ²⁵⁴	4.76 ⁷¹	43.46 ²⁵⁸	42.382 ⁴³¹	14.01 ³¹
30.8	3.683 ³⁰⁵	10.94 ¹⁴⁶	36.799 ³²⁰	38.65 ²¹⁴	5.57 ⁸¹	41.39 ²⁰⁷	42.837 ⁴⁵⁵	14.00 ¹
b. 9.8	3.994 ³¹¹	12.25 ¹³¹	37.133 ³³⁴	36.99 ¹⁶⁶	6.46 ⁸⁹	39.95 ¹⁴⁴	43.302 ⁴⁶⁵	14.31 ³¹
	3.994 ³⁰⁹	12.25 ¹⁰⁹	37.133 ³³³	36.99 ¹¹³	6.46 ⁹⁴	39.95 ⁸⁰	43.302 ⁴⁶⁷	14.31 ⁵⁷
19.8	4.303	13.34	37.471	35.86	7.40	39.15	43.769	14.88
ur. 1.7	4.605 ³⁰²	14.20 ⁵⁸	37.804 ³³³	35.29 ⁵⁷	8.35 ⁹⁵	39.03 ¹²	44.228 ⁴⁵⁹	15.71 ⁸³
11.7	4.896 ²⁹¹	14.78 ³¹	38.125 ³²¹	35.31 ²	9.27 ⁹²	39.60 ⁵⁷	44.672 ⁴⁴⁴	16.76 ¹⁰⁵
21.7	5.171 ²⁷⁵	15.09 ⁵	38.426 ³⁰¹	35.89 ⁵⁸	10.13 ⁸⁶	40.80 ¹²⁰	45.095 ⁴²³	18.00 ¹²⁴
31.7	5.427 ²⁵⁶	15.14 ²²	38.704 ²⁷⁸	37.01 ¹¹²	10.91 ⁷⁸	42.59 ¹⁷⁹	45.492 ³⁹⁷	19.39 ¹³⁹
	5.427 ²³⁶	15.14 ²²	38.704 ²⁵⁰	37.01 ¹⁵⁸	10.91 ⁶⁷	42.59 ²³⁰	45.492 ³⁶⁷	19.39 ¹⁵²
ur. 10.6	5.663	14.92	38.954	38.59	11.58	44.89	45.859	20.91
20.6	5.875 ²¹²	14.49 ⁴³	39.172 ²¹⁸	40.58 ¹⁹⁹	12.12 ⁵⁴	47.61 ²⁷²	46.191 ³³²	22.54 ¹⁶³
30.6	6.062 ¹⁸⁷	13.88 ⁶¹	39.357 ¹⁸⁵	42.88 ²³⁰	12.52 ⁴⁰	50.64 ³⁰³	46.486 ²⁹⁵	24.24 ¹⁷⁰
ay 10.5	6.223 ¹⁶¹	13.10 ⁷⁸	39.504 ¹⁴⁷	45.41 ²⁵³	12.76 ²⁴	53.87 ³²³	46.738 ²⁵²	25.98 ¹⁷⁴
20.5	6.355 ¹³²	12.24 ⁸⁶	39.614 ¹¹⁰	48.07 ²⁶⁶	12.85 ⁹	57.19 ³³²	46.944 ²⁰⁶	27.74 ¹⁷⁶
	6.355 ¹⁰²	12.24 ⁹³	39.614 ⁷⁰	48.07 ²⁷¹	12.85 ⁶	57.19 ³³¹	46.944 ¹⁵⁸	27.74 ¹⁷⁴
30.5	6.457 ⁶⁹	11.31 ⁹⁵	39.684 ²⁹	50.78 ²⁶⁸	12.79 ²¹	60.50 ³¹⁹	47.102 ¹⁰⁷	29.48 ¹⁶⁸
ne 9.5	6.526 ³⁸	10.36 ⁹⁶	39.713 ¹⁰	53.46 ²⁵⁵	12.58 ³⁷	63.69 ²⁹⁸	47.209 ⁵³	31.16 ¹⁵⁹
19.4	6.564 ⁴	9.40 ⁹¹	39.703 ⁴⁸	56.01 ²³⁷	12.21 ⁴⁹	66.67 ²⁹⁸	47.262 ³	32.75 ¹⁴⁶
29.4	6.568 ³¹	8.49 ⁸⁷	39.655 ⁸⁷	58.38 ²¹²	11.72 ⁶²	69.37 ²³⁵	47.259 ⁵⁵	34.21 ¹²⁹
ly 9.4	6.537 ⁶²	7.62 ⁸⁰	39.568 ¹²³	60.50 ¹⁸²	11.10 ⁷²	71.72 ¹⁹⁴	47.204 ¹⁰⁷	35.50 ¹⁰⁶
19.4	6.475	6.82	39.445	62.32	10.38	73.66	47.097	36.56
29.3	6.384 ⁹¹	6.12 ⁷⁰	39.291 ¹⁵⁴	63.82 ¹⁵⁰	9.56 ⁸²	75.13 ¹⁴⁷	46.943 ¹⁵⁴	37.37 ⁸¹
ug. 8.3	6.265 ¹¹⁹	5.51 ⁶¹	39.110 ¹⁸¹	64.94 ¹¹²	8.67 ⁸⁹	76.12 ⁹⁹	46.746 ¹⁹⁷	37.91 ⁵⁴
18.3	6.126 ¹³⁹	4.99 ⁵²	38.905 ²⁰⁵	65.67 ⁷³	7.74 ⁹³	76.61 ⁴⁹	46.518 ²²⁸	38.12 ²¹
28.2	5.971 ¹⁵⁵	4.58 ⁴¹	38.686 ²¹⁹	65.99 ³²	6.78 ⁹⁶	76.57 ⁴	46.266 ²⁵²	38.01 ¹¹
	5.971 ¹⁶²	4.58 ²⁷	38.686 ²²⁶	65.99 ⁹	6.78 ⁹⁷	76.57 ⁵⁶	46.266 ²⁶²	38.01 ⁴⁴
pt. 7.2	5.809	4.31	38.460	65.90	5.81	76.01	46.004	37.57
17.2	5.648 ¹⁶¹	4.15 ¹⁶	38.236 ²²⁴	65.37 ⁵³	4.86 ⁹⁵	74.95 ¹⁰⁶	45.746 ²⁵⁸	36.79 ⁷⁸
27.2	5.496 ¹⁵²	4.13 ²	38.024 ²¹²	64.43 ⁹⁴	3.95 ⁹¹	73.38 ¹⁵⁷	45.504 ²⁴²	35.71 ¹⁰⁸
st. 7.1	5.364 ¹³²	4.26 ¹³	37.832 ¹⁹²	63.08 ¹³⁵	3.10 ⁸⁵	71.35 ²⁰³	45.293 ²¹¹	34.37 ¹³⁴
17.1	5.261 ¹⁰³	4.58 ³²	37.671 ¹⁶¹	61.33 ¹⁷⁵	2.35 ⁷⁵	68.89 ²⁴⁶	45.127 ¹⁶⁶	32.80 ¹⁵⁷
	5.261 ⁶⁷	4.58 ⁴⁹	37.671 ¹²²	61.33 ²¹²	2.35 ⁶⁵	68.89 ²⁸⁴	45.127 ¹¹⁰	32.80 ¹⁷¹
27.1	5.194	5.07	37.549	59.21	1.70	66.05	45.017	31.09
iv. 6.1	5.170 ²⁴	5.75 ⁶⁸	37.475 ⁷⁴	56.76 ²⁴⁵	1.19 ⁵¹	62.87 ³¹⁸	44.974 ⁴³	29.29 ¹⁸⁰
16.0	5.194 ⁷⁴	6.63 ⁸⁸	37.452 ²³	54.04 ²⁷²	0.83 ³⁶	59.43 ³⁴⁴	45.003 ²⁹	27.49 ¹⁸⁰
26.0	5.267 ²³	7.71 ¹⁰⁶	37.485 ³³	51.10 ²⁹⁴	0.63 ²⁰	55.84 ³⁵⁹	45.107 ¹⁰⁴	25.75 ¹⁷⁴
c. 6.0	5.390 ¹²³	8.97 ¹²⁸	37.574 ⁸⁹	48.00 ³¹⁰	0.61 ²	52.16 ³⁶⁸	45.287 ¹⁸⁰	24.17 ¹⁵⁸
	5.390 ¹⁶⁹	8.97 ¹³⁹	37.574 ¹⁴⁶	48.00 ³¹⁶	0.61 ¹⁵	52.16 ³⁶⁵	45.287 ²⁴⁹	24.17 ¹³⁹
15.9	5.559	10.36	37.720	44.84	0.76	48.51	45.536	22.78
25.9	5.772 ²¹³	11.88 ¹⁵²	37.916 ¹⁹⁶	41.72 ³¹²	1.08 ³²	45.02 ³⁴⁹	45.847 ³¹¹	21.66 ¹¹²
35.9	6.018 ²⁴⁶	13.46 ¹⁵⁸	38.157 ²⁴¹	38.75 ²⁹⁷	1.57 ⁴⁹	41.77 ³²⁵	46.212 ³⁶⁵	20.83 ⁸⁸
Place	2.798	2.61	36.434	57.19	8.672	64.08	41.667	20.31
Tan δ	1.002	-0.061	1.207	+0.676	4.158	+4.036	1.554	-1.190
$D_{\alpha} \alpha$	+0.06	0.00	+0.05	+0.02	-0.03	+0.12	+0.09	-0.04
$D_{\alpha} \delta$	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Ophiuchi. Mag. 3.3			σ Scorpii. Mag. 3.1			τ Herculis. Mag. 3.9			γ Herculis. Mag. 3.8		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 16 13	s — 4 29	"	h m 16 16	s — 25 23	"	h m 16 17	s +46 30	"	h m 16 18	s +19 20	"
Jan. 0.9	58.857		40.17	12.128		48.72	15.573		16.42	17.874		33.25
10.9	59.124 ²⁶⁷		41.69 ¹⁵²	12.425 ²⁹⁷		49.25 ⁵³	15.856 ²⁸³		13.35 ³⁰⁷	18.128 ²⁵⁴		30.79 ²⁴⁶
20.8	59.413 ²⁸⁹		43.19 ¹⁵⁰	12.746 ³²¹		49.92 ⁶⁷	16.181 ³²⁵		10.64 ²⁷¹	18.407 ²⁷⁹		28.54 ²²⁵
30.8	59.717 ³⁰⁴		44.61 ¹⁴²	13.083 ³³⁷		50.69 ⁷⁷	16.538 ³⁵⁷		8.38 ²²⁶	18.706 ²⁹⁹		26.58 ¹⁹⁶
Feb. 9.8	60.028 ³¹¹		45.88 ¹²⁷	13.428 ³⁴⁵		51.54 ⁸⁵	16.913 ³⁷⁵		6.66 ¹⁷²	19.015 ³⁰⁹		24.99 ¹⁵⁹
	310		107	344		87	384		112	312		118
19.8	60.338		46.95 ⁸⁵	13.772		52.41	17.297		5.54 ⁴⁷	19.327		23.81 ⁷²
Mar. 1.7	60.641 ³⁰³		47.80 ⁵⁸	14.110 ³³⁸		53.27 ⁸⁶	17.679 ³⁸²		5.07 ¹⁶	19.632 ³⁰³		23.09 ²⁴
11.7	60.934 ²⁹³		48.38 ³²	14.436 ³²⁶		54.11 ⁸⁴	18.050 ³⁷¹		5.23 ⁷⁸	19.929 ²⁹⁷		22.85 ²⁴
21.7	61.212 ²⁷⁸		48.70 ⁶	14.746 ³¹⁰		54.89 ⁷⁸	18.399 ³⁴⁹		6.01 ¹³⁶	20.211 ²⁸²		23.09 ⁶⁸
31.7	61.470 ²⁵⁸		48.76 ¹⁹	15.038 ²⁹²		55.59 ⁷⁰	18.721 ³²²		7.37 ¹⁸⁹	20.472 ²⁶¹		23.77 ¹¹⁰
Apr. 10.6	61.709		48.57	15.307		56.23	19.009		9.26	20.711		24.87
20.6	61.925 ²¹⁶		48.17 ⁴⁰	15.554 ²⁴⁷		56.80 ⁵⁷	19.257 ²⁴⁸		11.57 ²³¹	20.924 ²¹³		26.30 ¹⁴³
30.6	62.118 ¹⁹³		47.59 ⁵⁸	15.773 ²¹⁹		57.30 ⁵⁰	19.463 ²⁰⁶		14.24 ²⁶⁷	21.111 ¹⁸⁷		28.03 ¹⁷³
May 10.5	62.283 ¹⁶⁵		46.86 ⁷³	15.964 ¹⁹¹		57.74 ⁴⁴	19.622 ¹⁵⁹		17.14 ²⁹⁰	21.267 ¹⁵⁶		29.97 ¹⁹⁴
20.5	62.420 ¹³⁷		46.04 ⁸²	16.123 ¹⁵⁹		58.12 ³⁸	19.734 ¹¹²		20.19 ³⁰⁵	21.391 ¹²⁴		32.06 ²⁰⁹
	106		89	127		34	62		308	93		213
30.5	62.526 ⁷⁴		45.15 ⁹¹	16.250 ⁹²		58.46 ²⁹	19.796 ¹³		23.27 ³⁰²	21.484 ⁵⁶		34.19 ²¹⁴
June 9.5	62.600 ⁴³		44.24 ⁹²	16.342 ⁵⁴		58.75 ²⁵	19.809 ³⁷		26.29 ²⁸⁹	21.540 ²²		36.33 ²⁰⁷
19.4	62.643 ⁷		43.32 ⁸⁸	16.396 ¹⁶		59.00 ¹⁹	19.772 ⁸⁴		29.18 ²⁶⁷	21.562 ¹⁴		38.40 ¹⁹⁴
29.4	62.650 ²⁷		42.44 ⁸⁴	16.412 ²²		59.19 ¹³	19.688 ¹²⁹		31.85 ²³⁹	21.548 ⁴⁸		40.34 ¹⁷⁸
July 9.4	62.623 ⁵⁹		41.60 ⁷⁷	16.390 ⁵⁹		59.32 ⁷	19.559 ¹⁷²		34.24 ²⁰⁴	21.500 ⁸³		42.12 ¹⁵³
19.4	62.564 ⁸⁹		40.83 ⁶⁸	16.331 ⁹³		59.39 ¹	19.387 ²⁰⁹		36.28 ¹⁵⁶	21.417 ¹¹³		43.67 ¹³¹
29.3	62.475 ¹¹⁷		40.15 ⁶¹	16.238 ¹²⁵		59.38 ¹⁰	19.178 ²⁴¹		37.94 ¹²²	21.304 ¹³⁹		44.98 ¹⁰⁴
Aug. 8.3	62.358 ¹³⁸		39.54 ⁵¹	16.113 ¹⁴⁹		59.28 ²¹	18.937 ²⁶⁷		39.16 ⁷⁸	21.165 ¹⁶²		46.02 ⁷⁴
18.3	62.220 ¹⁵⁴		39.03 ⁴¹	15.964 ¹⁶⁹		59.07 ³⁰	18.670 ²⁸³		39.94 ³⁰	21.003 ¹⁷⁸		46.76 ⁴⁴
28.2	62.066 ¹⁶³		38.62 ³⁰	15.795 ¹⁷⁷		58.77 ⁴⁰	18.387 ²⁹⁰		40.24 ¹⁷	20.825 ¹⁸⁶		47.20 ¹¹
Sept. 7.2	61.903		38.32 ¹⁸	15.618		58.37 ⁴⁹	18.097		40.07 ⁶⁵	20.639 ¹⁸⁶		47.31 ²¹
17.2	61.741 ¹⁶²		38.14 ⁵	15.441 ¹⁷⁷		57.88 ⁵⁶	17.808 ²⁸⁹		39.42 ¹¹⁴	20.453 ¹⁷⁷		47.10 ⁵²
27.2	61.588 ¹⁵³		38.09 ¹⁰	15.276 ¹⁶⁵		57.32 ⁶¹	17.531 ²⁷⁷		38.28 ¹⁵⁹	20.276 ¹⁵⁸		46.55 ⁸
Oct. 7.1	61.454 ¹³⁴		38.19 ²⁶	15.130 ¹⁴⁶		56.71 ⁶²	17.279 ²⁵²		36.69 ²⁰³	20.118 ¹³¹		45.69 ¹²
17.1	61.349 ⁶⁹		38.45 ⁴³	15.017 ⁷³		56.09 ⁶⁰	17.061 ¹⁷⁴		34.66 ²⁴³	19.987 ⁹⁷		44.49 ¹⁵
27.1	61.280		38.88 ⁶¹	14.944 ²⁶		55.49 ⁵⁴	16.887 ¹²²		32.23 ²⁷⁸	19.890 ⁵³		42.97 ¹⁸
Nov. 6.1	61.253 ²¹		39.49 ⁸¹	14.918 ²⁷		54.95 ⁴⁴	16.765 ⁶²		29.45 ³⁰⁸	19.837 ⁵		41.17 ²⁰
16.0	61.274 ⁷⁰		40.30 ¹⁰⁰	14.945 ⁸³		54.51 ²⁹	16.703 ⁴		26.37 ³³⁰	19.832 ⁴⁵		39.09 ²²
26.0	61.344 ¹²⁰		41.30 ¹¹⁸	15.028 ¹³⁷		54.22 ¹³	16.707 ⁶⁸		23.07 ³⁴⁵	19.877 ⁹⁷		36.80 ²⁴
Dec. 6.0	61.464 ¹⁶⁸		42.48 ¹³³	15.165 ¹⁹⁰		54.09 ⁵	16.775 ¹³⁵		19.62 ³⁴⁸	19.974 ¹⁴⁵		34.34 ²⁵
15.9	61.632		43.81 ¹⁴⁴	15.355 ²³⁴		54.14 ²⁵	16.910 ¹⁹⁵		16.14 ³⁴²	20.119 ¹⁹⁰		31.76 ²⁵
25.9	61.841 ²⁰⁹		45.25 ¹⁵⁰	15.589 ²⁷⁴		54.39 ⁴²	17.105 ²⁵¹		12.72 ³²⁴	20.309 ²³⁰		29.18 ²⁵
35.9	62.086		46.75	15.863		54.81	17.356		9.48	20.539		26.65
Mean Place	58.842		36.74	12.063		49.64	16.559		28.79	18.122		41.30
Sec δ , Tan δ	1.003		-0.079	1.107		-0.475	1.453		+1.054	1.060		+0.351
$D\psi\alpha$, $D_{\omega}\alpha$	+0.06		0.00	+0.07		-0.01	+0.04		+0.03	+0.05		+0.01
$D\psi\delta$, $D_{\omega}\delta$	-0.2		-0.9	-0.2		-0.9	-0.2		-0.9	-0.2		-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Ursæ Minoris. Mag. 5.0		γ Apodis. Mag. 3.9		ω Herculis. Mag. 4.5		η Draconis. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 19	s +75 56	h m 16 20	s -78 42	h m 16 21	s +14 12	h m 16 22	s +61 41
Jan. 0.9	47.70	26.99	47.26	47.63	37.421	69.46	50.59	44.90
10.9	48.25 55	23.93 306	48.34 108	45.75 188	37.672 251	67.18 228	50.93 34	41.72 318
20.9	48.93 68	21.29 264	49.54 120	44.33 142	37.949 277	65.08 210	51.33 40	38.92 280
30.8	49.72 79	19.17 212	50.84 130	43.38 95	38.243 294	63.20 188	51.78 45	36.64 228
Feb. 9.8	50.60 88	17.63 154	52.22 138	42.94 44	38.547 304	61.66 154	52.29 51	34.93 171
	92	87	139	3	307	117	51	108
19.8	51.52	16.76	53.61	42.97	38.854	60.49	52.80	33.85
Mar. 1.7	52.46	16.55 21	54.99 138	43.48 51	39.156 302	59.73 76	53.32 52	33.47 38
	91	48	136	95	293	33	49	29
11.7	53.37	17.03	56.35	44.43	39.449	59.40	53.81	33.76
21.7	54.27	18.16	57.66	45.81	39.728 279	59.51 11	54.29 48	34.71 96
31.7	55.02 75	19.87 171	58.88 122	47.56 175	39.988 260	60.03 52	54.73 44	36.27 156
	68	224	112	210	238	90	39	211
Apr. 10.6	55.70	22.11	60.00	49.66	40.226	60.93	55.12	38.38
20.6	56.26 56	24.79 268	61.00 100	52.03 237	40.441 215	62.16 123	55.45 33	40.94 256
30.6	56.67 41	27.79 300	61.87 87	54.64 261	40.630 189	63.65 149	55.71 26	43.84 290
May 10.6	56.94 27	31.00 321	62.60 73	57.42 278	40.791 161	65.36 171	55.90 19	47.00 316
20.5	57.06 12	34.33 333	63.14 54	60.32 290	40.921 130	67.20 184	56.03 13	50.30 330
	2	333	39	295	99	191	4	333
30.5	57.04	37.66	63.53 20	63.27 294	41.020 65	69.11 191	56.07 4	53.63 326
June 9.5	56.83 21	40.89 323	63.73 1	66.21 284	41.085 31	71.02 187	56.03 11	56.89 309
	34	304	17	283	3	187	17	286
19.4	56.49 47	43.93 277	63.74 1	69.04 267	41.116 31	72.89 176	55.92 11	59.98 286
29.4	56.02 60	46.70 242	63.57 34	71.71 244	41.113 38	74.65 161	55.75 24	62.84 254
July 9.4	55.42 70	49.12 203	63.23 52	74.15 212	41.075 72	76.26 143	55.51 30	65.38 215
19.4	54.72	51.15	62.71	76.27	41.003	77.69	55.21	67.53
29.3	53.93	52.73	62.05	78.01	40.900 103	78.89 120	54.86 35	69.27 174
Aug. 8.3	53.07 86	53.83 110	61.27 78	79.32 131	40.770 130	79.87 98	54.46 40	70.53 126
18.3	52.15 92	54.42 59	60.37 90	80.14 82	40.619 151	80.59 72	54.03 43	71.31 78
28.3	51.19 96	54.50 8	59.42 95	80.45 31	40.450 169	81.05 46	53.58 45	71.57 26
	96	44	98	24	178	17	45	26
Sept. 7.2	50.23	54.06	58.44	80.21	40.272	81.22	53.13	71.31
17.2	49.28 95	53.10 96	57.48 96	79.43 78	40.094 178	81.10 12	52.67 46	70.54 77
27.2	48.37 91	51.64 146	56.57 91	78.12 131	39.924 170	80.70 40	52.23 44	69.25 129
Oct. 7.1	47.51 86	49.71 193	55.76 81	76.33 179	39.772 152	80.00 70	51.82 41	67.48 177
17.1	46.74 77	47.35 236	55.08 68	74.11 222	39.645 127	79.01 99	51.46 36	65.25 223
	66	277	51	257	92	129	31	266
27.1	46.08	44.58	54.57	71.54	39.553	77.72	51.15	62.59
Nov. 6.1	45.56 52	41.47 311	54.27 30	68.72 282	39.504 49	76.16 156	50.92 23	59.57 302
16.0	45.17 39	38.11 336	54.18 9	65.75 297	39.501 3	74.36 180	50.76 16	56.26 331
26.0	44.94 23	34.54 357	54.32 14	62.75 300	39.548 47	72.33 203	50.70 6	52.72 354
Dec. 6.0	44.90 4	30.89 365	54.69 37	59.81 294	39.645 97	70.13 220	50.73 3	49.05 367
	12	364	59	276	146	232	12	368
15.9	45.02	27.25	55.28	57.05	39.791	67.81	50.85	45.37
25.9	45.31 29	23.74 351	56.07 79	54.57 248	39.980 189	65.44 237	51.05 20	41.79 358
35.9	45.78 47	20.47 327	57.04 97	52.44 213	40.209 229	63.11 233	51.34 29	38.41 338
Mean Place	52.953	41.32	49.734	55.93	37.607	76.38	52.699	58.27
Sec δ , Tan δ	4.118	+3.994	5.111	-5.012	1.032	+0.253	2.109	+1.857
$D\psi a$, $D_{\omega} a$	-0.03	+0.11	+0.18	-0.14	+0.05	+0.01	+0.02	+0.05
$D\psi \delta$, $D_{\omega} \delta$	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Scorpii. (Antares.) Mag. 1.2			β Herculis. Mag. 2.8			λ Ophiuchi. Mag. 3.8			Δ Draconis Mag. 5.0		
	Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.	
	h m 16 24	° ' " -26 15		h m 16 26	° ' " +21 39		h m 16 26	° ' " + 2 9		h m 16 28	° ' " +	
Jan. 0.9	22.633	2.87		41.290	54.54		46.504	40.51		4.95	30	
10.9	22.926 ²⁹³	3.29 ⁴²		41.537 ²⁴⁷	52.01 ²⁵³		46.756 ²⁵²	38.72 ¹⁷⁹		5.34 ³⁹	27	
20.9	23.244 ³¹⁸	3.86 ⁵⁷		41.812 ²⁷⁵	49.68 ²³³		47.032 ²⁷⁶	37.01 ¹⁷¹		5.82 ⁴⁸	24	
30.8	23.580 ³³⁶	4.55 ⁶⁹		42.107 ²⁹⁵	47.65 ²⁰³		47.325 ²⁹³	35.45 ¹⁵⁶		6.38 ⁵⁶	22	
Feb. 9.8	23.925 ³⁴⁵	5.30 ⁷⁵		42.416 ³⁰⁹	46.01 ¹⁶⁴		47.628 ³⁰³	34.09 ¹²⁶		6.99 ⁶¹	20	
	23.925 ³⁴⁵	5.30 ⁸⁰		42.416 ³¹²	46.01 ¹²²		47.628 ³⁰⁴	34.09 ¹¹⁰		6.99 ⁶⁵		
19.8	24.270	6.10		42.728	44.79		47.932	32.99		7.64	19	
Mar. 1.7	24.612 ³⁴²	6.89 ⁷⁹		43.038 ³¹⁰	44.05 ⁷⁴		48.233 ³⁰¹	32.19 ⁸⁰		8.29 ⁶⁵	19	
11.7	24.943 ³³¹	7.66 ⁷⁷		43.338 ³⁰⁰	43.81 ²⁴		48.525 ²⁹²	31.70 ⁴⁹		8.94 ⁶⁵	19	
21.7	25.259 ³¹⁶	8.39 ⁷³		43.625 ²⁸⁷	44.07 ²⁶		48.803 ²⁷⁸	31.55 ¹⁵		9.55 ⁶¹	20	
31.7	25.557 ²⁹⁸	9.06 ⁶⁷		43.893 ²⁶⁸	44.79 ⁷²		49.065 ²⁶²	31.72 ¹⁷		10.12 ⁵⁷	22	
	25.557 ²⁷⁸	9.06 ⁶¹		43.893 ²⁴⁶	44.79 ¹¹⁵		49.065 ²⁴³	31.72 ⁴⁶		10.12 ⁵⁰		
Apr. 10.6	25.835	9.67		44.139	45.94		49.308	32.18		10.62	24	
20.6	26.089 ²⁵⁴	10.22 ⁵⁵		44.360 ²²¹	47.46 ¹⁵²		49.530 ²²²	32.91 ⁷³		11.03 ⁴¹	26	
30.6	26.319 ²³⁰	10.72 ⁵⁰		44.554 ¹⁹⁴	49.27 ¹⁸¹		49.727 ¹⁹⁷	33.85 ⁹⁴		11.36 ³³	29	
May 10.6	26.520 ²⁰¹	11.16 ⁴⁴		44.717 ¹⁶³	51.33 ²⁰⁶		49.897 ¹⁷⁰	34.97 ¹²²		11.60 ²⁴	33	
20.5	26.689 ¹⁶⁹	11.57 ⁴¹		44.849 ¹³²	53.52 ²¹⁹		50.041 ¹⁴⁴	36.19 ¹¹²		11.73 ¹³	36	
	26.689 ¹³⁷	11.57 ³⁶		44.849 ⁹⁸	53.52 ²²⁶		50.041 ¹¹²	36.19 ¹³⁰		11.73 ³		
30.5	26.826 ¹⁰⁰	11.93 ³³		44.947 ⁶²	55.78 ²²⁷		50.153 ⁸⁰	37.49 ¹³²		11.76 ⁷	39	
June 9.5	26.926 ⁶³	12.26 ²⁸		45.009 ²⁶	58.05 ²²⁰		50.233 ⁴⁸	38.81 ¹³⁰		11.69 ¹⁶	43	
19.4	26.989 ²³	12.54 ²³		45.035 ¹⁰	60.25 ²⁰⁶		50.281 ¹³	40.11 ¹²⁴		11.53 ²⁷	46	
29.4	27.012 ¹⁶	12.77 ¹⁹		45.025 ⁴⁶	62.31 ¹⁹⁰		50.294 ²²	41.35 ¹¹⁵		11.26 ³⁵	49	
July 9.4	26.996 ⁵⁵	12.96 ¹²		44.979 ⁸¹	64.21 ¹⁶⁶		50.272 ⁵⁵	42.50 ¹⁰⁴		10.91 ⁴²	51	
19.4	26.941	13.08		44.898	65.87		50.217	43.54		10.49	53	
29.3	26.852 ⁸⁹	13.12 ⁴		44.784 ¹¹⁴	67.29 ¹⁴²		50.130 ⁸⁷	44.46 ⁹²		9.99 ⁵⁰	55	
Aug. 8.3	26.729 ¹²³	13.07 ⁵		44.643 ¹⁴¹	68.41 ¹¹²		50.015 ¹¹⁵	45.22 ⁷⁶		9.44 ⁵⁵	56	
18.3	26.581 ¹⁴⁸	12.92 ¹⁵		44.477 ¹⁶⁶	69.22 ⁸¹		49.877 ¹³⁸	45.83 ⁶¹		8.85 ⁵⁹	57	
28.3	26.412 ¹⁶⁹	12.65 ²⁷		44.295 ¹⁸²	69.71 ⁴⁹		49.722 ¹⁵⁵	46.28 ⁴⁵		8.24 ⁶¹	57	
	26.412 ¹⁷⁹	12.65 ³⁶		44.295 ¹⁹²	69.71 ¹⁵		49.722 ¹⁶⁷	46.28 ²⁶		8.24 ⁶⁴		
Sept. 7.2	26.233	12.29		44.103	69.86		49.555	46.54		7.60	57	
17.2	26.052 ¹⁸¹	11.83 ⁴⁶		43.910 ¹⁹³	69.66 ²⁰		49.387 ¹⁶⁸	46.63 ⁹		6.98 ⁶²	56	
27.2	25.882 ¹⁷⁰	11.28 ⁵⁵		43.724 ¹⁸⁶	69.12 ⁵⁴		49.227 ¹⁶⁰	46.53 ¹⁰		6.37 ⁶¹	55	
Oct. 7.1	25.731 ¹⁵¹	10.68 ⁶⁰		43.556 ¹⁶⁸	68.23 ⁸⁹		49.083 ¹⁴⁴	46.22 ³¹		5.80 ⁵⁷	53	
17.1	25.610 ¹²¹	10.04 ⁶⁴		43.414 ¹⁴²	67.00 ¹²³		48.966 ¹¹⁷	45.71 ⁵¹		5.29 ⁵¹	51	
	25.610 ⁸⁰	10.04 ⁶²		43.414 ¹⁰⁷	67.00 ¹⁵⁶		48.966 ⁸⁴	45.71 ⁷³		5.29 ⁴⁴		
27.1	25.530	9.42		43.307	65.44		48.882	44.98		4.85	48	
Nov. 6.1	25.496 ³⁴	8.84 ⁵⁸		43.243 ⁶⁴	63.58 ¹⁸⁶		48.840 ⁴²	44.04 ⁹⁴		4.50 ³⁵	45	
16.0	25.516 ²⁰	8.35 ⁴⁹		43.226 ¹⁷	61.43 ²¹⁵		48.843 ³	42.88 ¹¹⁶		4.26 ²⁴	42	
26.0	25.590 ⁷⁴	7.99 ³⁶		43.259 ²³	59.06 ²³⁷		48.896 ⁵³	41.52 ¹³⁶		4.11 ¹⁵	39	
Dec. 6.0	25.720 ¹³⁰	7.79 ²⁰		43.344 ⁸⁵	56.50 ²⁵⁶		48.998 ¹⁰²	39.99 ¹⁵³		4.09 ²	35	
	25.720 ¹⁸¹	7.79 ⁴		43.344 ¹³⁶	56.50 ²⁶⁵		48.998 ¹⁴⁹	39.99 ¹⁶⁷		4.09 ¹⁰		
16.0	25.901	7.75		43.480	53.85		49.147	38.32		4.19	31	
25.9	26.130 ²²⁹	7.90 ¹⁵		43.662 ¹⁸²	51.17 ²⁶⁸		49.340 ¹⁹³	36.56 ¹⁷⁶		4.41 ²²	28	
35.9	26.399 ²⁶⁹	8.22 ³²		43.884 ²²²	48.55 ²⁶²		49.569 ²²⁹	34.77 ¹⁷⁹		4.74 ³³	24	
Mean Place	22.597	3.91		41.609	62.54		46.578	44.93		8.196	44	
Sec δ , Tan δ	1.115	-0.493		1.076	+0.397		1.001	+0.038		2.783	+2	
$D\psi a$, $D_{\omega} a$	+0.07	-0.01		+0.05	+0.01		+0.06	0.00		0.00	+0.	
$D\psi \delta$, $D_{\omega} \delta$	-0.2	-0.9		-0.2	-0.9		-0.2	-0.9		-0.2	-0.	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Scorpii. Mag. 2.9		σ Herculis. Mag. 4.2		ζ Ophiuchi. Mag. 2.7		η Scorpii. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 30	° ' -28 2	h m 16 31	° ' +42 35	h m 16 32	° ' -10 24	h m 16 36	° ' -17 35
	s	"	s	"	s	"	s	"
Jan. 0.9	46.485	47.94	26.654	68.53	38.481	9.02	49.682	4.47
10.9	46.778 ²⁹³	48.24 ³⁰	26.914 ²⁶⁰	65.46 ³⁰⁷	38.741 ²⁶⁰	10.20 ¹¹⁸	49.949 ²⁶⁷	5.26 ⁷⁹
20.9	47.097 ³¹⁹	48.68 ⁴⁴	27.214 ³⁰⁰	62.71 ²⁷⁵	39.025 ²⁸⁴	11.39 ¹¹⁹	50.241 ²⁹²	6.12 ⁸⁶
30.8	47.434 ³³⁷	49.24 ⁵⁶	27.545 ³³¹	60.38 ²³³	39.327 ³⁰²	12.54 ¹¹⁵	50.552 ³¹¹	7.01 ⁸⁹
Feb. 9.8	47.782 ³⁴⁸	49.89 ⁶⁵	27.897 ³⁵²	58.55 ¹⁸³	39.638 ³¹¹	13.62 ¹⁰⁸	50.872 ³²⁰	7.89 ⁸⁸
	350	72	362	125	313	96	324	83
19.8	48.132	50.61	28.259	57.30	39.951	14.57	51.196	8.72
Mar. 1.7	48.478 ³⁴⁶	51.35 ⁷⁴	28.622 ³⁶³	56.65 ⁶⁵	40.262 ³¹¹	15.35 ⁷⁸	51.517 ³²¹	9.44 ⁷²
11.7	48.816 ³³⁸	52.08 ⁷³	28.976 ³⁵⁴	56.64 ¹	40.563 ³⁰¹	15.94 ⁵⁹	51.831 ³¹⁴	10.07 ⁶³
21.7	49.140 ³²⁴	52.78 ⁷⁰	29.315 ³³⁹	57.23 ⁵⁹	40.853 ²⁹⁰	16.33 ³⁹	52.132 ³⁰¹	10.56 ⁴⁹
31.7	49.446 ³⁰⁶	53.45 ⁶⁷	29.630 ³¹⁵	58.41 ¹¹⁸	41.128 ²⁷⁵	16.50 ¹⁷	52.418 ²⁸⁶	10.91 ³⁵
	287	63	288	171	256	3	269	21
Apr. 10.6	49.733	54.08	29.918	60.12	41.384	16.47	52.687	11.12
20.6	49.996 ²⁶³	54.67 ⁵⁹	30.171 ²⁵³	62.27 ²¹⁵	41.620 ²³⁶	16.27 ²⁰	52.935 ²⁴⁸	11.22 ¹⁰
30.6	50.234 ²³⁸	55.22 ⁵⁵	30.386 ²¹⁵	64.79 ²⁵²	41.832 ²¹²	15.92 ³⁵	53.159 ²²⁴	11.22 ⁰
May 10.6	50.444 ²¹⁰	55.73 ⁵¹	30.560 ¹⁷⁴	67.57 ²⁷⁸	42.019 ¹⁸⁷	15.46 ⁴⁶	53.357 ¹⁹⁸	11.13 ⁹
20.5	50.622 ¹⁷⁸	56.21 ⁴⁸	30.691 ¹³¹	70.51 ²⁰⁴	42.178 ¹⁵⁹	14.91 ⁵⁵	53.527 ¹⁷⁰	10.98 ¹⁵
	145	44	85	303	128	60	140	20
30.5	50.767 ¹⁰⁹	56.65 ⁴¹	30.776 ³⁸	73.54 ²⁹⁸	42.306 ⁹⁷	14.31 ⁶³	53.667 ¹⁰⁶	10.78 ²²
June 9.5	50.876 ⁷⁰	57.06 ³³	30.814 ⁸	76.52 ²⁹⁰	42.403 ⁶¹	13.68 ⁶⁴	53.773 ⁷⁰	10.56 ²⁴
19.4	50.946 ²⁹	57.44 ³⁸	30.806 ⁵	79.42 ²⁷⁰	42.464 ²⁶	13.04 ⁶²	53.843 ³³	10.32 ²⁵
29.4	50.975 ¹¹	57.77 ²⁸	30.752 ⁹⁴	82.12 ²⁴⁵	42.490 ¹⁰	12.42 ⁵⁹	53.876 ⁴	10.07 ²⁵
July 9.4	50.964 ⁴⁹	58.05 ²⁰	30.653 ¹⁴⁰	84.57 ²¹³	42.480 ⁴⁴	11.83 ⁵⁶	53.872 ⁴²	9.82 ²⁵
19.4	50.915	58.25 ¹³	30.513 ¹⁷⁹	86.70 ¹⁷⁷	42.436 ⁸⁰	11.27 ⁵¹	53.830 ⁷⁷	9.57 ²⁵
29.3	50.827 ⁸⁸	58.38 ³	30.334 ²¹³	88.47 ¹³⁹	42.356 ¹⁰⁹	10.76 ⁴⁷	53.753 ¹¹⁰	9.32 ²⁶
Aug. 8.3	50.706 ¹⁵⁰	58.41 ⁸	30.121 ²³⁹	89.86 ⁹⁴	42.247 ¹³⁴	10.29 ⁴³	53.643 ¹³⁵	9.06 ²⁸
18.3	50.556 ¹⁷⁰	58.33 ²²	29.882 ²⁵⁹	90.80 ⁵⁰	42.113 ¹⁵³	9.86 ³⁷	53.508 ¹⁵⁶	8.78 ³⁰
28.3	50.386 ¹⁸³	58.11 ³³	29.623 ²⁶⁸	91.30 ³	41.960 ¹⁶⁵	9.49 ³²	53.352 ¹⁷⁰	8.48 ³¹
Sept. 7.2	50.203	57.78	29.355	91.33	41.795	9.17	53.182	8.17
17.2	50.018 ¹⁸⁵	57.34 ⁴⁴	29.085 ²⁷⁰	90.89 ⁴⁴	41.627 ¹⁶⁸	8.92 ²⁵	53.009 ¹⁷³	7.85 ³²
27.2	49.841 ¹⁷⁷	56.79 ⁵⁵	28.824 ²⁶¹	89.99 ⁹⁰	41.467 ¹⁶⁰	8.73 ¹⁹	52.844 ¹⁶⁵	7.53 ³²
Oct. 7.1	49.684 ¹⁵⁷	56.16 ⁶³	28.583 ²⁴¹	88.63 ¹³⁶	41.323 ¹⁴⁴	8.63 ¹⁰	52.694 ¹⁵⁰	7.22 ³¹
17.1	49.557 ¹²⁷	55.48 ⁶⁸	28.372 ²¹¹	86.83 ¹⁸⁰	41.205 ¹¹⁸	8.64 ¹	52.572 ¹²²	6.96 ²⁶
	88	69	171	220	82	12	87	20
27.1	49.469 ⁴⁰	54.79 ⁶⁷	28.201 ¹²³	84.63 ²⁵⁸	41.123 ⁴¹	8.76 ²⁸	52.485 ⁴⁴	6.76 ¹¹
Nov. 6.1	49.429 ¹²	54.12 ⁶⁰	28.078 ⁸	82.05 ²³⁸	41.082 ⁶	9.04 ⁴³	52.441 ⁵	6.65 ¹
16.0	49.441 ⁶⁸	53.52 ⁴⁸	28.011 ⁶⁷	79.17 ³¹⁴	41.088 ⁵⁷	9.47 ⁵⁹	52.446 ⁵⁶	6.66 ¹⁴
26.0	49.509 ¹²⁴	53.04 ³⁵	28.003 ⁵⁶	76.03 ³³⁰	41.145 ¹⁰⁶	10.06 ⁷⁷	52.502 ¹⁰⁸	6.80 ³¹
Dec. 6.0	49.633 ¹⁷⁸	52.69 ¹⁷	28.059 ¹¹⁷	72.73 ³³⁸	41.251 ¹⁵⁵	10.83 ⁹¹	52.610 ¹⁵⁹	7.11 ⁴⁵
16.0	49.811	52.52	28.176	69.35	41.406	11.74	52.769	7.56
25.9	50.038 ²²⁷	52.52 ⁰	28.351 ¹⁷⁵	65.99 ³³⁶	41.605 ¹⁹⁹	12.78 ¹⁰⁴	52.972 ²⁰³	8.15 ⁵⁹
35.9	50.305 ²⁶⁷	52.71 ¹⁹	28.579 ²²⁸	62.78 ³²¹	41.841 ²³⁶	13.91 ¹¹³	53.214 ²⁴²	8.88 ⁷³
Mean Place	46.472	49.29	27.549	79.28	38.495	7.11	49.686	3.93
Sec δ , Tan δ	1.133	-0.533	1.359	+0.920	1.017	-0.184	1.049	-0.317
$D\psi\alpha$, $D_\omega\alpha$	+0.07	-0.01	+0.04	+0.02	+0.07	0.00	+0.07	-0.01
$D\psi\delta$, $D_\omega\delta$	-0.2	-0.9	-0.2	-0.9	-0.1	-0.9	-0.1	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Herculis. Mag. 3.0		α Triang. Aust. Mag. 1.9		γ Herculis. Mag. 3.6		Groombridge 2377. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 38	s +31 44	h m 16 39	s -68 52	h m 16 40	s +39 4	h m 16 43	s +56 55
Jan. 0.9	11.102	53.44	57.05	37.66	4.236	29.17	42.686	29.97
10.9	11.341	50.60	57.64	35.93	4.482	26.15	42.968	26.68
20.9	11.616	48.02	58.31	34.56	4.767	23.41	43.309	23.75
30.8	11.916	45.79	59.04	33.60	5.081	21.04	43.699	21.27
Feb. 9.8	12.233	44.00	59.80	33.07	5.416	19.18	44.124	19.32
19.8	12.559	42.71	60.58	32.95	5.762	17.85	44.573	18.00
Mar. 1.8	12.885	41.96	61.37	33.24	6.111	17.11	45.030	17.32
11.7	13.205	41.78	62.14	33.92	6.454	16.97	45.483	17.33
21.7	13.511	42.17	62.89	34.96	6.783	17.46	45.919	18.00
31.7	13.800	43.09	63.61	36.33	7.091	18.50	46.327	19.29
Apr. 10.6	14.065	44.50	64.27	38.00	7.376	20.07	46.697	21.16
20.6	14.303	46.34	64.89	39.92	7.629	22.10	47.023	23.51
30.6	14.511	48.52	65.42	42.08	7.848	24.48	47.295	26.26
May 10.6	14.686	50.96	65.89	44.39	8.029	27.15	47.510	29.31
20.5	14.825	53.59	66.28	46.83	8.171	29.99	47.662	32.54
30.5	14.926	56.30	66.58	49.35	8.270	32.93	47.750	35.85
June 9.5	14.987	59.01	66.78	51.87	8.325	35.86	47.772	39.15
19.5	15.008	61.63	66.87	54.35	8.335	38.70	47.729	42.35
29.4	14.988	64.12	66.87	56.72	8.300	41.38	47.624	45.34
July 9.4	14.929	66.40	66.76	58.90	8.222	43.83	47.458	48.05
19.4	14.832	68.40	66.57	60.84	8.102	45.98	47.235	50.44
29.3	14.698	70.10	66.28	62.48	7.945	47.79	46.961	52.43
Aug. 8.3	14.533	71.46	65.92	63.74	7.755	49.22	46.644	53.98
18.3	14.343	72.45	65.48	64.60	7.537	50.25	46.291	55.07
28.3	14.133	73.04	65.00	65.01	7.298	50.85	45.914	55.66
Sept. 7.2	13.912	73.22	64.49	64.94	7.047	51.00	45.521	55.75
17.2	13.687	72.99	63.98	64.40	6.793	50.70	45.125	55.31
27.2	13.470	72.35	63.49	63.38	6.546	49.94	44.738	54.36
Oct. 7.2	13.268	71.30	63.04	61.91	6.316	48.74	44.375	52.92
17.1	13.093	69.86	62.67	60.06	6.114	47.11	44.046	51.00
27.1	12.952	68.03	62.38	57.86	5.949	45.06	43.766	48.64
Nov. 6.1	12.855	65.86	62.19	55.42	5.830	42.66	43.545	45.88
16.0	12.808	63.37	62.13	52.82	5.764	39.93	43.392	42.77
26.0	12.814	60.64	62.20	50.17	5.754	36.93	43.316	39.41
Dec. 6.0	12.875	57.73	62.39	47.56	5.804	33.75	43.318	35.86
16.0	12.990	54.71	62.70	45.09	5.912	30.48	43.402	32.23
25.9	13.156	51.67	63.13	42.83	6.076	27.22	43.565	28.65
35.9	13.368	48.73	63.68	40.88	6.292	24.06	43.803	25.22
Mean Place	11.679	62.27	58.081	44.38	5.040	38.32	44.483	41.02
Sec δ, Tan δ	1.176	+0.619	2.775	-2.589	1.288	+0.812	1.832	+1.536
$D\phi\alpha, D\omega\alpha$	+0.05	+0.01	+0.13	-0.06	+0.04	+0.02	+0.02	+0.03
$D\phi\delta, D\omega\delta$	-0.1	-0.9	-0.1	-0.9	-0.1	-0.9	-0.1	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	ε Scorpii. Mag. 2.4		49 Herculis. Mag. 6.4		ε¹ Aræ. Mag. 4.2		κ Ophiuchi. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 44	° ' -34 8	h m 16 48	° ' +15 6	h m 16 53	° ' -53 2	h m 16 53	° ' + 9 29
	s "	"	s "	"	s "	"	s "	"
n. 0.9	50.853	42.23	20.527	33.12	2.185	5.18	46.923	60.99
10.9	51.149 ²⁹⁶	42.11 ¹²	20.755 ²²⁸	30.82 ²³⁰	2.559 ³⁷⁴	4.01 ¹¹⁷	47.149 ²²⁶	58.94 ²⁰⁵
20.9	51.475 ³²⁶	42.16 ⁵	21.015 ²⁰⁰	28.68 ²¹⁴	2.960 ⁴²¹	3.11 ⁹⁰	47.404 ²⁵⁵	57.00 ¹⁹⁴
30.8	51.824 ³⁴⁹	42.38 ²²	21.295 ²⁸⁰	26.76 ¹⁹²	3.434 ⁴⁵⁴	2.52 ⁵⁹	47.680 ²⁷⁶	55.25 ¹⁷⁵
b. 9.8	52.186 ³⁶²	42.74 ³⁶	21.589 ²⁹⁴	25.17 ¹⁵⁹	3.910 ⁴⁷⁶	2.23 ²⁹	47.970 ²⁹⁰	53.76 ¹⁴⁹
	52.186 ³⁶⁸	42.74 ⁴⁸	21.589 ³⁰²	25.17 ¹²³	3.910 ⁴⁸⁸	2.23 ²	47.970 ²⁹⁷	53.76 ¹¹⁷
19.8	52.554	43.22	21.891	23.94	4.398	2.21	48.267	52.59
ar. 1.8	52.920 ³⁶⁶	43.78 ⁵⁶	22.193 ³⁰²	23.12 ⁸²	4.890 ⁴⁹²	2.48 ²⁷	48.566 ²⁹⁰	51.78 ⁸¹
11.7	53.280 ³⁶⁰	44.40 ⁶²	22.490 ²⁹⁷	22.75 ³⁷	5.375 ⁴⁸⁵	2.99 ⁵¹	48.861 ²⁹⁵	51.37 ⁴¹
21.7	53.628 ³⁴⁸	45.08 ⁶⁸	22.778 ²⁸⁸	22.82 ⁷	5.848 ⁴⁷³	3.75 ⁷⁶	49.147 ²⁸⁶	51.34 ³
31.7	53.960 ³³²	45.79 ⁷¹	23.052 ²⁷⁴	23.32 ⁵⁰	6.300 ⁴⁵²	4.71 ⁹⁶	49.420 ²⁷³	51.72 ³⁸
	53.960 ³¹³	45.79 ⁷²	23.052 ²⁵⁵	23.32 ⁹⁰	6.300 ⁴³⁰	4.71 ¹¹⁶	49.420 ²⁵⁷	51.72 ⁷³
or. 10.7	54.273	46.51	23.307	24.22	6.730	5.87	49.677	52.45
20.6	54.565 ²⁹²	47.24 ⁷³	23.543 ²³⁶	25.48 ¹²⁶	7.127 ³⁹⁷	7.19 ¹³²	49.915 ²³⁸	53.51 ¹⁰⁶
30.6	54.830 ²⁶⁵	47.99 ⁷⁵	23.754 ²¹¹	27.03 ¹⁵⁵	7.490 ³⁶³	8.65 ¹⁴⁶	50.130 ²¹⁵	54.82 ¹³¹
ay 10.6	55.066 ²³⁶	48.74 ⁷⁵	23.939 ¹⁸⁵	28.80 ¹⁷⁷	7.811 ³²¹	10.23 ¹⁵⁸	50.321 ¹⁹¹	56.34 ¹⁵²
20.5	55.269 ²⁰³	49.49 ⁷⁵	24.094 ¹⁵⁵	30.73 ¹⁹³	8.088 ²⁷⁷	11.91 ¹⁶⁸	50.483 ¹⁶²	58.02 ¹⁶⁸
	55.269 ¹⁶⁸	49.49 ⁷⁶	24.094 ¹²³	30.73 ²⁰²	8.088 ²²⁵	11.91 ¹⁷³	50.483 ¹³¹	58.02 ¹⁷⁶
30.5	55.437	50.25	24.217	32.75	8.313	13.64	50.614	59.78
ne 9.5	55.565 ¹²⁸	50.99 ⁷⁴	24.308 ⁹¹	34.79 ²⁰⁴	8.484 ¹⁷¹	15.39 ¹⁷⁵	50.714 ¹⁰⁰	61.56 ¹⁷⁸
19.5	55.651 ⁸⁶	51.70 ⁷¹	24.362 ⁵⁴	36.80 ²⁰¹	8.596 ¹¹²	17.12 ¹⁷³	50.778 ⁶⁴	63.32 ¹⁷⁶
29.4	55.694 ⁴³	52.37 ⁶⁷	24.379 ¹⁷	38.71 ¹⁹¹	8.647 ⁵¹	18.79 ¹⁶⁷	50.805 ²⁷	65.00 ¹⁶⁸
ly 9.4	55.693 ¹	52.99 ⁶²	24.359 ²⁰	40.48 ¹⁷⁷	8.636 ¹¹	20.34 ¹⁵⁵	50.796 ⁹	66.56 ¹⁵⁶
	55.693 ⁴⁶	52.99 ⁵³	24.359 ⁵⁶	40.48 ¹⁵⁹	8.636 ⁷²	20.34 ¹⁴⁰	50.796 ⁴⁴	66.56 ¹⁴²
19.4	55.647	53.52	24.303	42.07	8.564	21.74	50.752	67.98
29.4	55.559 ⁸⁸	53.94 ⁴²	24.214 ⁸⁹	43.45 ¹³⁸	8.434 ¹³⁰	22.91 ¹¹⁷	50.672 ⁸⁰	69.21 ¹²³
ig. 8.3	55.434 ¹²⁵	54.21 ¹³	24.093 ¹²¹	44.58 ¹¹³	8.252 ¹⁸²	23.85 ⁹⁴	50.560 ¹¹²	70.24 ¹⁰³
18.3	55.276 ¹⁵⁸	54.34 ²⁷	23.947 ¹⁴⁶	45.47 ⁸⁹	8.025 ²²⁷	24.48 ⁶³	50.422 ¹³⁸	71.06 ⁸²
28.3	55.094 ¹⁸²	54.29 ⁵	23.778 ¹⁶⁹	46.07 ⁶⁰	7.765 ²⁶⁰	24.79 ³¹	50.262 ¹⁶⁰	71.64 ⁵⁸
	55.094 ¹⁹⁸	54.29 ²³	23.778 ¹⁸⁰	46.07 ³¹	7.765 ²⁸⁴	24.79 ³	50.262 ¹⁷³	71.64 ³⁴
pt. 7.2	54.896	54.06	23.598	46.38	7.481	24.76	50.089	71.98
17.2	54.693 ²⁰³	53.67 ³⁹	23.413 ¹⁸⁵	46.40 ²	7.190 ²⁹¹	24.37 ³⁹	49.910 ¹⁷⁹	72.08 ¹⁰
27.2	54.497 ¹⁹⁶	53.10 ⁵⁷	23.232 ¹⁸¹	46.11 ²⁹	6.907 ²⁸³	23.63 ⁷⁴	49.734 ¹⁷⁶	71.91 ¹⁷
st. 7.2	54.318 ¹⁷⁹	52.37 ⁷³	23.065 ¹⁶⁷	45.52 ⁵⁹	6.646 ²⁶¹	22.55 ¹⁰⁸	49.571 ¹⁶³	71.49 ⁴²
17.1	54.170 ¹⁴⁸	51.54 ⁸³	22.920 ¹⁴⁵	44.63 ⁸⁹	6.424 ²²²	21.19 ¹³⁶	49.430 ¹⁴¹	70.80 ⁶⁹
	54.170 ¹⁰⁸	51.54 ⁹¹	22.920 ¹¹³	44.63 ¹¹⁹	6.424 ¹⁶⁹	21.19 ¹⁶¹	49.430 ¹¹⁰	70.80 ⁹⁵
27.1	54.062	50.63	22.807	43.44	6.255	19.58	49.320	69.85
rv. 6.1	54.002 ⁶⁰	49.68 ⁹⁵	22.733 ⁷⁴	41.97 ¹⁴⁷	6.148 ¹⁰⁷	17.80 ¹⁷⁸	49.248 ⁷²	68.64 ¹²¹
16.1	53.999 ³	48.76 ⁹²	22.705 ²⁸	40.22 ¹⁷⁵	6.115 ³³	15.91 ¹⁸⁹	49.221 ²⁷	67.20 ¹⁴⁴
26.0	54.053 ⁵⁴	47.90 ⁸⁵	22.725 ²⁰	38.25 ¹⁹⁷	6.160 ⁴⁵	13.99 ¹⁹²	49.241 ²⁰	65.52 ¹⁶⁸
c. 6.0	54.166 ¹¹³	47.15 ⁷⁶	22.795 ⁷⁰	36.08 ²¹⁷	6.284 ¹²⁴	12.11 ¹⁷⁵	49.310 ⁶⁹	63.67 ¹⁸⁵
	54.166 ¹⁷⁰	47.15 ⁶⁰	22.795 ¹¹⁸	36.08 ²³⁰	6.284 ²⁰³	12.11 ¹⁷⁵	49.310 ¹¹⁷	63.67 ¹⁹⁹
16.0	54.336	46.55	22.913	33.78	6.487	10.36	49.427	61.68
25.9	54.558 ²²²	46.12 ⁴³	23.077 ¹⁶⁴	31.42 ²³⁶	6.759 ²⁷²	8.79 ¹⁵⁷	49.588 ¹⁶¹	59.61 ²⁰⁷
35.9	54.826 ²⁶⁸	45.88 ²⁴	23.281 ²⁰⁴	29.08 ²³⁴	7.096 ³³⁷	7.45 ¹³⁴	49.790 ²⁰²	57.53 ²⁰⁸
Place	50.908	44.44	20.814	38.91	2.520	9.75	47.153	65.68
tan δ	1.208	-0.678	1.036	+0.270	1.663	-1.329	1.014	+0.168
Δα	+0.08	-0.01	+0.05	+0.01	+0.09	-0.03	+0.06	0.00
Δδ	-0.1	-0.9	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 Ophiuchi. Mag. 5.0			ε Herculis. Mag. 3.9			δ Herculis. Mag. 5.3			η Ophiuchi. Mag. 2.6		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 16 56	s — 4 5	" — 4 5	h m 16 57	s +31 2	" +31 2	h m 16 58	s +33 40	" +33 40	h m 17 5	s —15 37	" —15 37
Jan. 0.9	44.048	64.61	8.473	39.50	33.925	62.57	40.304	28.51				
10.9	44.280 ²³²	66.00 ¹³⁹	8.695 ²²²	36.64 ²⁸⁶	34.146 ²²¹	59.61 ²⁹⁶	40.543 ²³⁹	29.25 ⁷⁴				
20.9	44.542 ²⁶²	67.38 ¹³⁸	8.954 ²⁵⁹	34.01 ²⁶³	34.406 ²⁶⁰	56.95 ²⁶⁶	40.813 ²⁷⁰	30.04 ⁷⁹				
30.8	44.824 ²⁸²	68.67 ¹¹⁹	9.240 ²⁸⁶	31.71 ²³¹	34.695 ²³¹	54.58 ²³⁷	41.103 ²⁹⁰	30.84 ⁸⁰				
Feb. 9.8	45.119 ²⁹⁵	69.81 ¹¹⁴	9.547 ³⁰⁷	29.81 ¹⁹⁰	35.008 ³¹³	52.65 ¹⁹³	41.410 ³⁰⁷	31.59 ⁷⁵				
	302	96	319	140	324	144	313	68				
19.8	45.421	70.77	9.866	28.41	35.332	51.21	41.723	32.27				
Mar. 1.8	45.724 ³⁰³	71.49 ⁷²	10.189 ³²³	27.54 ⁸⁷	35.661 ³²⁹	50.33 ⁸⁸	42.039 ³¹⁶	32.84 ⁵⁷				
11.7	46.023 ²⁹⁹	71.97 ⁴⁸	10.510 ³²¹	27.22 ³²	35.988 ³²⁷	50.02 ³¹	42.351 ³¹²	33.28 ⁴⁴				
21.7	46.313 ²⁹⁰	72.17 ²⁰	10.821 ³¹¹	27.48 ²⁶	36.306 ³¹⁸	50.29 ²⁷	42.656 ³⁰⁵	33.56 ²⁸				
31.7	46.592 ²⁷⁹	72.11 ⁶	11.118 ²⁹⁷	28.27 ⁷⁹	36.609 ³⁰³	51.12 ⁸³	42.952 ²⁹⁶	33.70 ¹⁴				
	263	32	278	130	284	134	282	1				
Apr. 10.7	46.855	71.79	11.396	29.57	36.893	52.46	43.234	33.69				
20.6	47.101 ²⁴⁶	71.25 ⁵⁴	11.649 ²⁵³	31.31 ¹⁷⁴	37.151 ²⁵⁸	54.26 ¹⁸⁰	43.498 ²⁶⁴	33.55 ¹⁴				
30.6	47.327 ²²⁶	70.52 ⁷³	11.875 ²²⁶	33.42 ²¹¹	37.380 ²²⁹	56.44 ²¹⁸	43.742 ²⁴⁴	33.30 ²⁵				
May 10.6	47.527 ²⁰⁰	69.65 ⁸⁷	12.069 ¹⁹⁴	35.80 ²³⁸	37.577 ¹⁹⁷	58.92 ²⁴⁸	43.963 ²²¹	32.97 ³³				
20.5	47.701 ¹⁷⁴	68.67 ⁹⁸	12.229 ¹⁶⁰	38.40 ²⁶⁰	37.738 ¹⁶¹	61.59 ²⁶⁷	44.158 ¹⁹⁵	32.58 ³⁹				
	146	104	122	270	123	280	165	43				
30.5	47.847 ¹¹³	67.63 ¹⁰⁷	12.351 ⁸³	41.10 ²⁷³	37.861 ⁸²	64.39 ²⁸²	44.323 ¹³¹	32.16 ⁴³				
June 9.5	47.960 ⁷⁸	66.56 ¹⁰²	12.434 ⁴³	43.83 ²⁶⁸	37.943 ⁴⁰	67.21 ²⁷⁸	44.454 ⁹⁷	31.74 ⁴³				
19.5	48.038 ⁴²	65.51 ¹⁰⁵	12.477 ²	46.51 ²⁵⁵	37.983 [—]	69.99 ²⁶⁴	44.551 ⁵⁷	31.31 ⁴⁰				
29.4	48.080 ⁶	64.49 ⁹⁴	12.479 ⁴¹	49.06 ²³⁷	37.981 ⁴⁵	72.63 ²⁴⁵	44.608 ¹⁹	30.91 ³⁷				
July 9.4	48.086 ³¹	63.55 ⁸⁶	12.438 ⁸¹	51.43 ²¹²	37.936 ⁸⁷	75.08 ²¹⁹	44.627 ²¹	30.54 ³⁴				
19.4	48.055 ⁶⁷	62.69 ⁷⁷	12.357 ¹¹⁸	53.55 ¹⁸³	37.849 ¹²⁵	77.27 ¹⁹⁰	44.606 ⁵⁹	30.20 ³²				
29.4	47.988 ⁹⁸	61.92 ⁶⁵	12.239 ¹⁵³	55.38 ¹⁵⁰	37.724 ¹⁶⁰	79.17 ¹⁵⁵	44.547 ⁹³	29.88 ²⁹				
Aug. 8.3	47.890 ¹²⁷	61.27 ⁵⁵	12.086 ¹⁸¹	56.88 ¹¹⁴	37.564 ¹⁸⁹	80.72 ¹¹⁸	44.454 ¹²⁵	29.59 ²⁷				
18.3	47.763 ¹⁴⁹	60.72 ⁴⁴	11.905 ²⁰⁴	58.02 ⁷⁶	37.375 ²¹³	81.90 ⁷⁸	44.329 ¹⁴⁹	29.32 ²⁶				
28.3	47.614 ¹⁶⁵	60.28 ³¹	11.701 ²¹⁹	58.78 ³⁶	37.162 ²²⁸	82.68 ³⁶	44.180 ¹⁶⁷	29.06 ²⁵				
Sept. 7.2	47.449 ¹⁷¹	59.97 ¹⁸	11.482 ²²⁵	59.14 ⁵	36.934 ²³⁴	83.04 ⁶	44.013 ¹⁷⁴	28.81 ²⁷				
17.2	47.278 ¹⁶⁷	59.79 ⁶	11.257 ²²¹	59.09 ⁴⁶	36.700 ²³²	82.98 ⁴⁸	43.839 ¹⁷³	28.58 ²³				
27.2	47.111 ¹⁵⁵	59.73 ⁸	11.036 ²⁰⁸	58.63 ⁸⁸	36.468 ²¹⁷	82.50 ⁹²	43.666 ¹⁶¹	28.36 ¹⁹				
Oct. 7.2	46.956 ¹³³	59.81 ²⁴	10.828 ¹⁸⁵	57.75 ¹²⁸	36.251 ¹⁶²	81.58 ¹⁷⁴	43.505 ¹⁰⁷	28.17 ¹⁶				
17.1	46.823 ¹⁰²	60.05 ³⁹	10.643 ¹⁵²	56.47 ¹⁶⁷	36.057 ¹⁶²	80.25 ¹⁷⁴	43.366 ¹⁰⁷	28.01 ⁹				
27.1	46.721 ⁶³	60.44 ⁵⁶	10.491 ¹¹²	54.80 ²⁰⁴	35.895 ¹²¹	78.51 ²¹¹	43.259 ⁶⁹	27.92 ¹				
Nov. 6.1	46.658 ¹⁹	61.00 ⁷⁴	10.379 ⁶⁵	52.76 ²³⁴	35.774 ⁷²	76.40 ²⁴³	43.190 ²²	27.91 ⁹				
16.1	46.639 ²⁹	61.74 ⁹¹	10.314 ¹²	50.42 ²⁶⁴	35.702 ¹⁹	73.97 ²⁷¹	43.168 ²⁷	28.00 ²³				
26.0	46.668 ⁷⁸	62.65 ¹⁰⁷	10.302 ⁴¹	47.78 ²⁸²	35.683 ³⁵	71.26 ²⁹²	43.195 ⁷⁸	28.23 ³⁴				
Dec. 6.0	46.746 ¹²⁵	63.72 ¹²²	10.343 ⁹⁶	44.96 ²⁹⁷	35.718 ⁹¹	68.34 ³⁰⁶	43.273 ¹²⁸	28.57 ⁴⁷				
16.0	46.871 ¹⁷⁰	64.94 ¹³¹	10.439 ¹⁴⁷	41.99 ³⁰⁰	35.809 ¹⁴⁴	65.28 ³⁰⁹	43.401 ¹⁷⁴	29.04 ⁵⁹				
25.9	47.041 ²¹⁰	66.25 ¹³⁸	10.586 ¹⁹³	38.99 ²⁹⁵	35.953 ¹⁹²	62.19 ³⁰²	43.575 ²¹⁴	29.63 ⁷¹				
35.9	47.251	67.63	10.779	36.04	36.145	59.17	43.789	30.34				
Mean Place	44.162	62.11	9.100	46.90	34.628	70.17	40.388	27.86				
Sec δ, Tan δ	1.003	-0.072	1.167	+0.602	1.202	+0.667	1.039	-0.280				
$D\psi\alpha, D\omega\alpha$	+0.06	0.00	+0.05	+0.01	+0.04	+0.01	+0.07	0.00				
$D\psi\delta, D\omega\delta$	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0				

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	77 Scorpii. Mag. 3.4		ζ Draconis. Mag. 3.2		α Herculis. Var. 3.1-3.9		δ Herculis. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 6	° ' " -43 7	h m 17 8	° ' " +65 48	h m 17 10	° ' " +14 28	h m 17 11	° ' " +24 55
	s 16.416	" 54.10	s 29.79	" 46.80	s 54.126	" 53.66	s 39.234	" 60.52
a. 0.9	16.416 ³⁰⁷	53.34 ⁷⁶	29.79 ²⁸	46.80 ³³⁹	54.126 ²¹⁰	53.66 ²²⁵	39.234 ²⁰⁷	60.52 ²⁶⁷
10.9	17.069 ³⁴⁶	52.77 ⁵⁷	30.07 ³⁷	43.41 ³⁰⁹	54.336 ²⁴¹	51.41 ²¹⁰	39.441 ²⁴¹	57.85 ²⁴⁸
20.9	17.069 ³⁷⁵	52.41 ³⁶	30.44 ⁴⁴	40.32 ²⁶⁸	54.577 ²⁶⁶	49.31 ¹⁹¹	39.682 ²⁷⁰	55.37 ²²¹
30.9	17.444 ³⁹⁵	52.41 ¹⁴	30.88 ⁵¹	37.64 ²¹⁶	54.843 ²⁸³	47.40 ¹⁶¹	39.952 ²⁹⁰	53.16 ¹⁸⁶
b. 9.8	17.839 ⁴⁰⁷	52.27 ⁴	31.39 ⁵⁴	35.48 ¹⁵⁶	55.126 ²⁹⁴	45.79 ¹²⁷	40.242 ³⁰³	51.30 ¹⁴²
19.8	18.246 ⁴¹⁰	52.31 ²³	31.93 ⁵⁷	33.92 ⁹¹	55.420 ²⁹⁹	44.52 ⁸⁵	40.545 ³¹⁰	49.88 ⁹⁴
r. 1.8	18.656 ⁴⁰⁸	52.54 ³⁸	32.50 ⁵⁸	33.01 ²³	55.719 ²⁹⁸	43.67 ⁴³	40.855 ³⁰⁹	48.94 ⁴¹
11.7	19.064 ³⁹⁹	52.92 ⁵²	33.08 ⁵⁷	32.78 ⁴⁶	56.017 ²⁹²	43.24 ¹	41.164 ³⁰²	48.53 ¹⁰
21.7	19.463 ³⁸⁶	53.44 ⁶⁶	33.65 ⁵⁵	33.24 ¹¹⁰	56.309 ²⁸²	43.25 ⁴⁵	41.466 ²⁹²	48.63 ⁶²
31.7	19.849 ³⁶⁹	54.10 ⁷⁶	34.20 ⁵⁰	34.34 ¹⁷⁰	56.591 ²⁶⁷	43.70 ⁸⁶	41.758 ²⁷⁷	49.25 ¹⁰⁹
r. 10.7	20.218 ³⁴⁵	54.86 ⁸⁶	34.70 ⁴⁴	36.04 ²²⁴	56.858 ²⁴⁹	44.56 ¹²²	42.035 ²⁵⁵	50.34 ¹⁵¹
20.6	20.563 ³¹⁹	55.72 ⁹⁵	35.14 ³⁷	38.28 ²⁶⁸	57.107 ²²⁹	45.78 ¹⁵²	42.290 ²³⁴	51.85 ¹⁸⁸
30.6	20.882 ²⁸⁸	56.67 ¹⁰⁴	35.51 ³¹	40.96 ³⁰²	57.336 ²⁰³	47.30 ¹⁷⁵	42.524 ²⁰⁵	53.73 ²¹⁶
y 10.6	21.170 ²⁵²	57.71 ¹¹⁰	35.82 ²²	43.98 ³²⁵	57.539 ¹⁷⁶	49.05 ¹⁹⁴	42.729 ¹⁷⁴	55.89 ²³⁶
20.6	21.422 ²¹¹	58.81 ¹¹⁵	36.04 ¹³	47.23 ³⁴⁰	57.715 ¹⁴⁶	50.99 ²⁰⁴	42.903 ¹⁴¹	58.25 ²⁴⁹
30.5	21.633 ¹⁶⁸	59.96 ¹¹⁹	36.17 ⁵	50.63 ³⁴²	57.861 ¹¹¹	53.03 ²⁰⁷	43.044 ¹⁰⁴	60.74 ²⁵³
ne 9.5	21.801 ¹²⁰	61.15 ¹¹⁹	36.22 ⁵	54.05 ³³⁵	57.972 ⁷⁵	55.10 ²⁰⁶	43.148 ⁶⁵	63.27 ²⁵⁰
19.5	21.921 ⁷⁰	62.34 ¹¹⁵	36.17 ¹⁴	57.40 ³²¹	58.047 ³⁸	57.16 ¹⁹⁸	43.213 ²⁵	65.77 ²⁴¹
29.4	21.991 ¹⁸	63.49 ¹¹⁰	36.03 ²²	60.61 ²⁹⁵	58.085 ⁰	59.14 ¹⁸⁵	43.238 ¹⁶	68.18 ²⁴⁶
ly 9.4	22.009 ³⁴	64.59 ¹⁰⁰	35.81 ³⁰	63.56 ²⁶⁴	58.085 ³⁸	60.99 ¹⁶⁷	43.222 ⁵⁵	70.44 ²⁰³
19.4	21.975 ⁸⁵	65.59 ⁸⁸	35.51 ³⁷	66.20 ²²⁸	58.047 ⁷⁶	62.66 ¹⁴⁸	43.167 ⁹²	72.47 ¹⁷⁹
29.4	21.890 ¹³⁰	66.47 ⁶⁹	35.14 ⁴³	68.48 ¹⁸⁶	57.971 ¹⁰⁹	64.14 ¹²⁴	43.075 ¹²⁸	74.26 ¹⁴⁹
g. 8.3	21.760 ¹⁷¹	67.16 ⁵⁰	34.71 ⁴⁸	70.34 ¹³⁹	57.862 ¹³⁷	65.38 ¹⁰⁰	42.947 ¹⁵⁹	75.75 ¹¹⁸
18.3	21.589 ²⁰³	67.66 ²⁵	34.23 ⁵²	71.73 ⁹⁰	57.725 ¹⁶³	66.38 ⁷¹	42.788 ¹⁸²	76.93 ⁸³
28.3	21.386 ²²⁴	67.91 ²	33.71 ⁵⁶	72.63 ⁴⁰	57.562 ¹⁷⁸	67.09 ⁴⁵	42.606 ¹⁹⁹	77.76 ⁴⁸
pt. 7.3	21.162 ²³⁵	67.93 ²⁶	33.15 ⁵⁶	73.03 ¹³	57.384 ¹⁸⁷	67.54 ¹⁴	42.407 ²⁰⁸	78.24 ¹¹
17.2	20.927 ²³²	67.67 ⁵¹	32.59 ⁵⁴	72.90 ⁶⁶	57.197 ¹⁸⁶	67.68 ¹⁶	42.199 ²⁰⁷	78.35 ²⁸
27.2	20.695 ²¹⁶	67.16 ⁷⁷	32.05 ⁵⁴	72.24 ¹¹⁸	57.011 ¹⁷⁶	67.52 ⁴⁵	41.992 ¹⁹⁷	78.07 ⁶⁵
t. 7.2	20.479 ¹⁸⁸	66.39 ⁹⁸	31.51 ⁴⁹	71.06 ¹⁶⁷	56.835 ¹⁵⁵	67.07 ⁷⁶	41.795 ¹⁷⁷	77.42 ¹⁰³
17.1	20.291 ¹⁴⁵	65.41 ¹¹⁷	31.02 ⁴⁴	69.39 ²¹⁶	56.680 ¹²⁷	66.31 ¹⁰⁵	41.618 ¹⁴⁷	76.40 ¹³⁸
27.1	20.146 ⁹⁴	64.24 ¹²⁹	30.58 ³⁸	67.23 ²⁵⁸	56.553 ⁹²	65.26 ¹³⁴	41.471 ¹¹⁰	75.02 ¹⁷³
v. 6.1	20.052 ³⁵	62.95 ¹³⁶	30.20 ²⁹	64.65 ²⁹⁷	56.461 ⁴⁸	63.92 ¹⁶²	41.361 ⁶⁵	73.29 ²⁰⁶
16.1	20.017 ²⁹	61.59 ¹³⁸	29.91 ¹⁹	61.68 ³²⁷	56.413 ¹	62.30 ¹⁸⁴	41.296 ¹⁷	71.23 ²³¹
26.0	20.046 ⁹⁷	60.21 ¹³³	29.72 ¹⁰	58.41 ³⁵⁰	56.412 ⁹⁶	60.46 ²⁰⁶	41.279 ³⁵	68.92 ²⁵⁴
c. 6.0	20.143 ¹⁶⁰	58.88 ¹²²	29.62 ⁰	54.91 ³⁶²	56.461 ⁹⁶	58.40 ²¹⁹	41.314 ⁸⁵	66.38 ²⁶⁸
16.0	20.303 ²²⁰	57.66 ¹⁰⁹	29.62 ¹²	51.29 ³⁶⁴	56.557 ¹⁴²	56.21 ²²⁸	41.399 ¹³⁵	63.70 ²⁷⁵
26.0	20.523 ²⁷⁴	56.57 ⁹⁰	29.74 ²¹	47.65 ³⁵¹	56.699 ¹⁸⁴	53.93 ²²⁸	41.534 ¹⁷⁹	60.95 ²⁷³
35.9	20.797	55.67	29.95	44.14	56.883	51.65	41.713	58.22
Place	16.612	57.11	32.813	55.83	54.465	58.23	39.759	66.25
Tan δ	1.370	-0.937	2.441	+2.227	1.033	+0.258	1.103	+0.465
D _ω α	+0.09	-0.01	0.00	+0.03	+0.05	0.00	+0.05	+0.01
D _ω δ	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Herculis. Mag. 3.4			θ Ophiuchi. Mag. 3.4			ω Herculis. Mag. 5.4			β Arae. Mag. 2.8		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	"	h m	s	"	h m	s	"	h m	s	"
	17 12		+36 53	17 16		-24 55	17 17		+32 34	17 18		-55 27
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.9	10.558	56.11	58.198	7.31	34.681	14.47	28.314	9.53				
10.9	10.767	53.08	58.443	7.47	34.883	11.52	28.671	8.01				
20.9	11.018	50.26	58.720	7.73	35.125	8.78	29.081	6.74				
30.9	11.301	47.78	59.022	8.05	35.398	6.34	29.534	5.75				
Feb. 9.8	11.611	45.73	59.341	8.42	35.696	4.30	30.018	5.05				
	11.937	44.19	59.670	8.81	36.010	2.73	30.520	4.63				
Mar. 1.8	12.273	43.20	60.004	9.18	36.332	1.70	31.033	4.50				
11.8	12.609	42.82	60.336	9.51	36.656	1.24	31.547	4.65				
21.7	12.940	43.02	60.664	9.80	36.976	1.34	32.054	5.06				
31.7	13.258	43.81	60.982	10.02	37.284	2.02	32.547	5.72				
Apr. 10.7	13.556	45.14	61.286	10.20	37.577	3.22	33.020	6.60				
20.6	13.832	46.95	61.576	10.33	37.848	4.87	33.466	7.70				
30.6	14.078	49.18	61.846	10.43	38.093	6.93	33.879	8.98				
May 10.6	14.292	51.72	62.091	10.50	38.307	9.30	34.253	10.42				
20.6	14.468	54.49	62.309	10.57	38.489	11.91	34.578	12.03				
	14.805	57.40	62.497	10.64	38.633	14.66	34.853	13.73				
June 9.5	14.700	60.35	62.649	10.73	38.737	17.46	35.071	15.51				
19.5	14.750	63.28	62.763	10.84	38.799	20.24	35.226	17.32				
29.5	14.755	66.09	62.837	10.95	38.818	22.91	35.314	19.11				
July 9.4	14.714	68.71	62.867	11.08	38.794	25.42	35.337	20.84				
	14.629	71.08	62.856	11.20	38.726	27.70	35.290	22.43				
29.4	14.503	73.15	62.802	11.30	38.618	29.69	35.178	23.86				
Aug. 8.3	14.339	74.88	62.711	11.37	38.474	31.35	35.006	25.05				
18.3	14.143	76.12	62.585	11.39	38.297	32.66	34.782	25.98				
28.3	13.920	77.16	62.429	11.35	38.093	33.60	34.514	26.58				
Sept. 7.3	13.680	77.66	62.254	11.23	37.871	34.13	34.216	26.82				
17.2	13.431	77.73	62.069	11.02	37.640	34.24	33.903	26.70				
27.2	13.183	77.34	61.884	10.74	37.408	33.92	33.590	26.21				
Oct. 7.2	12.946	76.51	61.709	10.39	37.186	33.17	33.295	25.34				
17.2	12.731	75.24	61.556	9.99	36.985	32.00	33.033	24.13				
	12.547	73.54	61.436	9.56	36.814	30.44	32.820	22.64				
Nov. 6.1	12.404	71.45	61.355	9.12	36.681	28.48	32.670	20.89				
16.1	12.309	69.01	61.323	8.72	36.593	26.18	32.592	18.99				
26.0	12.267	66.27	61.342	8.38	36.556	23.58	32.594	16.98				
Dec. 6.0	12.281	63.29	61.414	8.14	36.572	20.76	32.679	14.96				
	12.352	60.17	61.538	7.99	36.642	17.77	32.844	12.99				
26.0	12.479	56.99	61.712	7.96	36.765	14.72	33.088	11.15				
35.9	12.656	53.87	61.930	8.05	36.938	11.70	33.401	9.48				
Mean Place	11.404	62.99	58.302	7.91	35.409	20.55	28.806	13.43				
Sec δ , Tan δ	1.250	+0.751	1.103	-0.465	1.187	+0.639	1.763	-1.453				
$D\psi\alpha$, $D\omega\alpha$	+0.04	+0.01	+0.07	-0.01	+0.04	+0.01	+0.10	-0.02				
$D\psi\delta$, $D\omega\delta$	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0				

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	<i>b</i> Ophiuchi. Mag. 4.3			<i>σ</i> Ophiuchi. Mag. 4.4			<i>δ</i> Aræ. Mag. 3.8			<i>α</i> Aræ. Mag. 3.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 17 21	s 24 6	" 18 6	h m 17 22	s + 4 12	" 18 6	h m 17 23	s -60 36	" 18 6	h m 17 25	s -49 48	" 18 6
Jan. 0.9	21.496	3.69	18	26.490	35.79	174	40.73	58.21	181	29.643	42.16	129
10.9	21.735	3.87	18	26.695	34.05	174	41.12	56.40	181	29.956	40.87	129
20.9	22.008	4.15	28	26.931	32.39	166	41.58	54.86	154	30.318	39.80	107
30.9	22.305	4.48	33	27.191	30.86	153	42.08	53.61	125	30.717	38.96	84
Feb. 9.8	22.620	4.85	37	27.469	29.52	134	42.62	52.67	94	31.142	38.36	60
19.8	22.946	5.22	37	27.758	28.45	107	43.19	52.06	61	31.587	37.99	37
Mar. 1.8	23.276	5.57	35	28.052	27.69	76	43.78	51.78	28	32.041	37.86	13
11.8	23.607	5.88	31	28.347	27.26	43	44.36	51.81	3	32.497	37.95	9
21.7	23.933	6.12	24	28.638	27.18	8	44.94	52.16	35	32.949	38.25	30
31.7	24.250	6.32	20	28.921	27.45	27	45.51	52.80	64	33.389	38.75	50
Apr. 10.7	24.554	6.45	13	29.193	28.06	61	46.05	53.71	91	33.813	39.43	68
20.6	24.844	6.52	7	29.449	28.84	88	46.57	54.89	118	34.215	40.28	85
30.6	25.115	6.56	4	29.687	30.08	114	47.04	56.29	140	34.591	41.30	103
May 10.6	25.362	6.57	0	29.902	31.41	133	47.48	57.89	160	34.933	42.46	116
20.6	25.582	6.57	1	30.093	32.88	147	47.85	59.67	178	35.236	43.75	129
30.5	25.773	6.58	1	30.254	34.44	156	48.17	61.58	191	35.494	45.13	138
June 9.5	25.928	6.60	2	30.384	36.04	160	48.41	63.58	200	35.703	46.59	146
19.5	26.046	6.64	4	30.480	37.63	159	48.59	65.63	203	35.857	48.09	150
29.5	26.123	6.70	6	30.538	39.15	152	48.69	67.67	204	35.953	49.59	150
July 9.4	26.158	6.78	8	30.558	40.58	143	48.71	69.64	197	35.989	51.04	145
19.4	26.150	6.86	8	30.540	41.89	131	48.66	71.48	184	35.966	52.41	137
29.4	26.101	6.93	7	30.484	43.03	114	48.53	73.14	166	35.883	53.63	123
Aug. 8.3	26.012	6.99	6	30.394	44.02	99	48.32	74.55	141	35.746	54.68	105
18.3	25.889	7.00	1	30.273	44.82	80	48.05	75.65	110	35.560	55.50	83
28.3	25.738	6.96	4	30.127	45.43	61	47.74	76.41	76	35.334	56.05	55
Sept. 7.3	25.565	6.86	10	29.961	45.84	41	47.39	76.77	36	35.079	56.30	25
17.2	25.381	6.68	18	29.786	46.05	21	47.02	76.73	4	34.809	56.24	6
27.2	25.196	6.43	25	29.609	46.05	0	46.65	76.27	46	34.536	55.84	40
Oct. 7.2	25.021	6.12	31	29.442	45.83	22	46.30	75.41	86	34.278	55.12	72
17.2	24.867	5.76	36	29.291	45.40	43	45.98	74.14	127	34.047	54.12	100
27.1	24.744	5.37	39	29.169	44.74	66	45.72	72.54	160	33.858	52.85	127
Nov. 6.1	24.660	4.99	84	29.080	43.87	87	45.54	70.65	189	33.724	51.37	148
16.1	24.623	4.63	37	29.033	42.77	110	45.43	68.54	211	33.652	49.73	164
26.0	24.637	4.34	14	29.032	41.48	129	45.41	66.31	223	33.652	48.02	171
Dec. 6.0	24.704	4.14	67	29.079	40.02	146	45.48	64.03	228	33.723	46.30	173
16.0	24.824	4.03	120	29.173	38.40	162	45.65	61.78	225	33.867	44.63	167
26.0	24.992	4.04	108	29.312	36.70	170	45.91	59.66	212	34.079	43.06	157
35.9	25.204	4.16	212	29.491	34.95	175	46.26	57.70	196	34.354	41.65	141
Mean Place	21.609	4.18		26.729	38.63		41.444	62.34		30.006	45.30	
Sec <i>δ</i> , Tan <i>δ</i>	1.096	-0.447		1.003	+0.074		2.038	-1.776		1.549	-1.184	
<i>Dψα</i> , <i>Dωα</i>	+0.07	-0.01		+0.06	0.00		+0.11	-0.02		+0.09	-0.01	
<i>Dψδ</i> , <i>Dωδ</i>	-0.1	-1.0		-0.1	-1.0		-0.1	-1.0		-0.1	-1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Hercules. Mag. 4.5		λ Scorpii. Mag. 1.7		β Draconis. Mag. 3.0		α Ophiuchi. Mag. 2.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 27	° ' " +26 10	h m 17 28	° ' " -37 2	h m 17 28	° ' " +52 21	h m 17 31	° ' " +12 36
Jan. 1.0	24.857	13.14	2.118	40.59	33.099	35.29	7.287	64.03
10.9	25.048	10.44	2.381	39.99	33.300	31.91	7.479	61.90
20.9	25.277	7.91	2.682	39.53	33.560	28.78	7.705	59.86
30.9	25.536	5.63	3.011	39.22	33.872	26.01	7.957	58.01
Feb. 9.8	25.817	3.71	3.364	39.05	34.225	23.69	8.229	56.42
19.8	26.115	2.21	3.730	39.00	34.608	21.92	8.514	55.17
Mar. 1.8	26.423	1.19	4.103	39.06	35.013	20.75	8.807	54.29
11.8	26.733	0.69	4.478	39.21	35.425	20.25	9.103	53.81
21.7	27.039	0.74	4.849	39.45	35.835	20.40	9.396	53.77
31.7	27.338	1.30	5.212	39.76	36.232	21.20	9.683	54.15
Apr. 10.7	27.624	2.36	5.562	40.13	36.608	22.62	9.959	54.93
20.7	27.892	3.86	5.896	40.57	36.953	24.57	10.219	56.07
30.6	28.137	5.73	6.208	41.07	37.261	26.99	10.462	57.51
May 10.6	28.356	7.92	6.495	41.65	37.525	29.78	10.682	59.20
20.6	28.547	10.33	6.751	42.29	37.738	32.87	10.877	61.07
30.5	28.702	12.89	6.972	42.99	37.898	36.13	11.041	63.05
June 9.5	28.820	15.52	7.154	43.74	38.000	39.46	11.173	65.09
19.5	28.900	18.13	7.293	44.52	38.041	42.79	11.270	67.11
29.5	28.938	20.65	7.384	45.31	38.023	46.01	11.328	69.07
July 9.4	28.936	23.03	7.428	46.10	37.946	49.03	11.347	70.92
19.4	28.892	25.21	7.422	46.85	37.811	51.81	11.327	72.60
29.4	28.808	27.14	7.367	47.52	37.621	54.25	11.268	74.10
Aug. 8.4	28.686	28.79	7.267	48.10	37.383	56.32	11.174	75.38
18.3	28.532	30.10	7.127	48.54	37.104	57.97	11.048	76.43
28.3	28.352	31.08	6.953	48.82	36.789	59.17	10.896	77.21
Sept. 7.3	28.152	31.69	6.755	48.92	36.451	59.88	10.723	77.74
17.2	27.940	31.92	6.542	48.82	36.099	60.09	10.539	77.98
27.2	27.728	31.76	6.328	48.51	35.746	59.80	10.352	77.95
Oct. 7.2	27.522	31.22	6.123	48.01	35.402	58.99	10.173	77.62
17.2	27.334	30.30	5.940	47.33	35.080	57.68	10.011	77.00
27.1	27.174	29.00	5.793	46.50	34.794	55.89	9.874	76.10
Nov. 6.1	27.050	27.34	5.689	45.56	34.554	53.65	9.771	74.92
16.1	26.968	25.34	5.637	44.55	34.370	51.01	9.709	73.48
26.1	26.934	23.08	5.644	43.52	34.248	48.01	9.693	71.79
Dec. 6.0	26.950	20.56	5.709	42.52	34.196	44.76	9.723	69.91
16.0	27.017	17.89	5.833	41.59	34.214	41.33	9.801	67.86
26.0	27.134	15.13	6.012	40.76	34.305	37.82	9.925	65.72
35.9	27.296	12.37	6.244	40.07	34.464	34.36	10.091	63.55
Mean Place	25.446	17.94	2.304	42.42	34.747	41.73	7.641	67.38
Sec δ , Tan δ	1.114	+0.491	1.253	-0.755	1.638	+1.297	1.025	+0.224
$D\psi\alpha$, $D\omega\alpha$	+0.05	0.00	+0.08	-0.01	+0.03	+0.01	+0.06	0.00
$D\psi\delta$, $D\omega\delta$	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington on Time.	ξ Serpentis. Mag. 3.6		ϵ Herculis. Mag. 3.8		ω Draconis. Mag. 4.9		η Pavonis. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 32	° ' " -15 20	h m 17 37	° ' " +46 2	h m 17 37	° ' " +68 47	h m 17 37	° ' " -64 40
n. 1.0	53.236	52.88	7.726	52.48	22.03	39.40	39.81	67.30
10.9	53.451 ²¹⁵	53.51 ⁶³	7.909 ¹⁸³	49.20 ³²⁸	22.25 ²²	35.95 ³⁴⁵	40.22 ⁴¹	65.19 ²¹¹
20.9	53.698 ²⁴⁷	54.17 ⁶⁶	8.146 ²³⁷	46.14 ³⁰⁶	22.59 ³⁴	32.71 ³²⁴	40.70 ⁴⁸	63.31 ¹⁸⁸
30.9	53.970 ²⁷²	54.83 ⁶⁶	8.426 ²⁸⁰	43.39 ²⁷⁵	23.01 ⁴²	29.84 ²⁸⁷	41.26 ⁵⁶	61.75 ¹⁵⁶
ab. 9.8	54.260 ²⁹⁰	55.45 ⁶²	8.743 ³¹⁷	41.07 ²³²	23.52 ⁵¹	27.42 ²⁴²	41.85 ⁵⁹	60.50 ¹²⁶
	304	53	345	180	57	185	63	92
19.8	54.564	55.98	9.088	39.27	24.09	25.57	42.48	59.58
ar. 1.8	54.873 ³⁰⁹	56.41 ⁴³	9.450 ³⁶²	38.04 ¹²³	24.71 ⁶²	24.33 ¹²⁴	43.14 ⁶⁶	59.02 ⁵⁶
11.8	55.184 ³¹¹	56.68 ²⁷	9.821 ³⁷¹	37.44 ⁶⁰	25.35 ⁶⁴	23.76 ⁵⁷	43.80 ⁶⁶	58.82 ²⁰
21.7	55.493 ³⁰⁹	56.82 ¹⁴	10.192 ³⁷¹	37.50 ⁶	26.00 ⁶⁵	23.87 ¹¹	44.46 ⁶⁶	58.96 ¹⁴
31.7	55.794 ³⁰¹	56.80 ²	10.555 ³⁶³	38.17 ⁶⁷	26.62 ⁶²	24.65 ⁷⁸	45.11 ⁶⁵	59.42 ⁴⁶
	293	16	345	127	59	142	63	77
pr. 10.7	56.087	56.64	10.900	39.44	27.21	26.07	45.74	60.19
20.7	56.366 ²⁷⁹	56.34 ³⁰	11.222 ³²²	41.26 ¹⁸²	27.76 ⁵⁵	28.04 ¹⁹⁷	46.34 ⁶⁰	61.27 ¹⁰⁸
30.6	56.628 ²⁶²	55.95 ³⁹	11.514 ²⁹²	43.54 ²²⁸	28.23 ⁴⁷	30.51 ²⁴⁷	46.89 ⁵⁵	62.62 ¹³⁵
ay 10.6	56.871 ²⁴³	55.48 ⁵⁷	11.769 ²⁵⁵	46.20 ²⁶⁶	28.62 ³⁹	33.37 ²⁸⁶	47.40 ⁵¹	64.22 ¹⁶⁰
20.6	57.088 ²¹⁷	54.96 ⁴²	11.982 ²¹³	49.15 ²⁹⁵	28.92 ³⁰	36.54 ³¹⁷	47.84 ⁴⁴	66.03 ¹⁸¹
	189	54	168	314	21	337	38	198
30.5	57.277	54.42	12.150	52.29	29.13	39.91	48.22	68.01
ine 9.5	57.433 ¹⁸⁶	53.88 ⁵⁴	12.268 ¹¹⁸	55.52 ³²³	29.24 ¹¹	43.39 ³⁴⁸	48.52 ³⁰	70.13 ²¹²
19.5	57.554 ¹²¹	53.37 ⁵¹	12.334 ⁶⁶	58.75 ³²³	29.24 ⁰	46.84 ³⁴⁵	48.75 ²³	72.31 ²¹⁸
29.5	57.636 ⁸²	52.90 ⁴⁷	12.347 ¹³	61.91 ³¹⁶	29.14 ¹⁰	50.21 ³³⁷	48.87 ¹²	74.53 ²²²
ily 9.4	57.678 ⁴²	52.48 ⁴²	12.306 ⁴¹	64.89 ²⁹⁸	28.94 ²⁰	53.39 ³¹⁸	48.91 ⁴	76.69 ²¹⁶
	2	38	94	275	30	293	4	205
19.4	57.680	52.10	12.212	67.64	28.64	56.32	48.87	78.74
29.4	57.640 ⁴⁰	51.78 ³²	12.069 ¹⁴³	70.08 ²⁴⁴	28.26 ³⁸	58.92 ²⁶⁰	48.73 ¹⁴	80.63 ¹⁸⁰
ug. 8.4	57.562 ⁷⁸	51.50 ²⁸	11.881 ¹⁸⁸	72.18 ²¹⁰	27.80 ⁴⁶	61.14 ²²²	48.51 ²²	82.27 ¹⁶⁴
18.3	57.450 ¹¹²	51.27 ²³	11.654 ²²⁷	73.88 ¹⁷⁰	27.28 ⁵²	62.93 ¹⁷⁹	48.22 ²⁹	83.61 ¹³⁴
28.3	57.310 ¹⁴⁰	51.06 ²¹	11.393 ²⁶¹	75.15 ¹²⁷	26.70 ⁵⁸	64.25 ¹³²	47.86 ³⁶	84.60 ⁹⁹
	162	18	285	80	62	83	40	58
apt. 7.3	57.148	50.88	11.108	75.95	26.08	65.08	47.46	85.18
17.2	56.973 ¹⁷⁵	50.71 ¹⁷	10.809 ²⁹⁹	76.29 ³⁴	25.43 ⁶⁵	65.39 ³¹	47.03 ⁴³	85.32 ¹⁴
27.2	56.796 ¹⁷⁷	50.56 ¹⁵	10.505 ³⁰⁴	76.14 ¹⁵	24.77 ⁶⁶	65.18 ²¹	46.59 ⁴⁴	85.01 ³¹
ct. 7.2	56.626 ¹⁷⁰	50.43 ¹³	10.209 ²⁹⁶	75.49 ⁶⁵	24.15 ⁶²	64.43 ⁷⁵	46.17 ⁴²	84.24 ⁷⁷
17.2	56.473 ¹⁵³	50.34 ⁹	9.931 ²⁷⁸	74.35 ¹¹⁴	23.55 ⁶⁰	63.17 ¹³⁶	45.80 ³⁷	83.05 ¹¹⁹
	124	5	246	161	56	177	33	159
27.1	56.349	50.29	9.685	72.74	22.99	61.40	45.47	81.46
ov. 6.1	56.260 ⁸⁹	50.31 ²	9.479 ²⁰⁶	70.69 ²⁰⁵	22.51 ⁴⁸	59.17 ²²³	45.22 ²⁵	79.55 ¹⁹¹
16.1	56.214 ⁴⁶	50.42 ¹¹	9.321 ¹⁵⁸	68.23 ²⁴⁶	22.10 ⁴¹	56.50 ²⁶⁷	45.05 ¹⁷	77.36 ²¹⁹
26.1	56.216 ²	50.62 ²⁰	9.220 ¹⁰¹	65.43 ²⁸⁰	21.79 ³¹	53.48 ³⁰²	44.99 ⁶	77.99 ²³⁷
ec. 6.0	56.266 ⁵⁰	50.93 ³¹	9.180 ⁴⁰	62.34 ³⁰⁹	21.60 ¹⁹	50.17 ³³¹	45.03 ⁴	72.52 ²⁴⁷
	100	41	23	328	9	351	16	247
16.0	56.366	51.34	9.203	59.06	21.51	46.66	45.19	70.05
26.0	56.513 ¹⁴⁷	51.85 ⁵¹	9.288 ⁸⁵	55.69 ³³⁷	21.54 ³	43.08 ³⁵⁸	45.44 ²⁵	67.65 ²⁴⁰
35.9	56.700 ¹⁸⁷	52.45 ⁶⁰	9.436 ¹⁴⁸	52.34 ³³⁵	21.70 ¹⁶	39.53 ³⁵⁵	45.79 ³⁵	65.41 ²²⁴
n Place	53.375	52.42	9.020	57.82	25.786	45.37	40.801	71.09
δ , Tan δ	1.037	-0.274	1.441	+1.037	2.765	+2.578	2.339	-2.114
δ , D _a α	+0.07	0.00	+0.03	+0.01	-0.01	+0.02	+0.11	-0.01
δ , D _a δ	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Ophiuchi. Mag. 2.9		ι^1 Scorpii. Mag. 3.1		μ Herculis. Mag. 3.5		ψ Draconis. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 39	° ' " + 4 35	h m 17 41	° ' " -40 5	h m 17 43	° ' " +27 45	h m 17 43	° ' " +72 11
	s 17 39	" + 4 35	s 17 41	" -40 5	s 17 43	" +27 45	s 17 43	" +72 11
Jan. 1.0	25.004	59.91	50.706	45.52	14.264	60.39	18.89	16.65
10.9	25.192 ¹⁸⁸	58.20 ¹⁷¹	50.962 ²⁵⁶	44.65 ⁸⁷	14.439 ¹⁷⁵	57.62 ²⁷⁷	19.11 ²²	13.18 ³⁴⁷
20.9	25.414 ²²²	56.56 ¹⁶⁴	51.260 ²⁹⁸	43.93 ⁷²	14.652 ²¹³	55.00 ²⁶²	19.46 ³⁵	9.92 ³³⁶
30.9	25.663 ²⁴⁹	55.04 ¹⁵²	51.589 ³²⁹	43.35 ⁵⁸	14.899 ²⁴⁷	52.61 ²³⁹	19.93 ⁴⁷	7.00 ²⁹²
Feb. 9.9	25.930 ²⁶⁷	53.72 ¹³²	51.945 ³⁵⁶	42.92 ⁴³	15.170 ²⁷¹	50.58 ²⁰³	20.50 ⁵⁷	4.53 ²⁴⁷
	282	106	373	28	291	161	65	192
19.8	26.212	52.66	52.318	42.64	15.461	48.97	21.15	2.61
Mar. 1.8	26.501 ²⁸⁹	51.92 ⁷⁴	52.701 ³⁸³	42.49 ¹⁵	15.766 ³⁰⁵	47.84 ¹¹³	21.87 ⁷²	1.30 ¹³¹
11.8	26.794 ²⁹³	51.49 ⁴³	53.089 ³⁸⁸	42.46 ³	16.076 ³¹⁰	47.24 ⁶⁰	22.61 ⁷⁴	0.65 ⁶⁵
21.7	27.086 ²⁹²	51.44 ⁵	53.476 ³⁸⁷	42.54 ⁸	16.386 ³¹⁰	47.17 ⁷	23.36 ⁷⁵	0.68 ³
31.7	27.373 ²⁸⁷	51.73 ²⁹	53.857 ³⁸¹	42.74 ²⁰	16.690 ³⁰⁴	47.66 ⁴⁹	24.09 ⁷³	1.37 ⁶⁹
	278	63	370	29	294	99	70	132
Apr. 10.7	27.651	52.36	54.227	43.03	16.984	48.65	24.79	2.69
20.7	27.916 ²⁶⁵	53.27 ⁹¹	54.582 ³⁵⁵	43.42 ³⁹	17.263 ²⁷⁹	50.11 ¹⁴⁶	25.42 ⁶³	4.00 ¹⁹¹
30.6	28.164 ²⁴⁸	54.46 ¹¹⁹	54.917 ³³⁵	43.91 ⁴⁹	17.521 ²⁵⁸	51.95 ¹⁸⁴	25.97 ⁵⁵	7.00 ²⁴⁰
May 10.6	28.393 ²²⁹	55.84 ¹³⁸	55.226 ³⁰⁹	44.50 ⁵⁹	17.754 ²³³	54.14 ²¹⁹	26.44 ⁴⁷	9.79 ²⁷⁹
20.6	28.597 ²⁰⁴	57.37 ¹⁵³	55.506 ²⁸⁰	45.20 ⁷⁰	17.958 ²⁰⁴	56.58 ²⁴⁴	26.80 ³⁶	12.91 ³¹²
	176	164	244	77	170	260	24	332
30.6	28.773	59.01	55.750	45.97	18.128	59.18	27.04	16.23
June 9.5	28.919 ¹⁴⁶	60.68 ¹⁶⁷	55.953 ²⁰³	46.81 ⁸⁴	18.261 ¹³³	61.87 ²⁶⁹	27.15 ¹¹	19.68 ³⁴⁵
19.5	29.029 ¹¹⁰	62.33 ¹⁶⁵	56.112 ¹⁵⁹	47.72 ⁹¹	18.356 ⁹⁵	64.57 ²⁷⁰	27.15 ⁰	23.12 ³⁴⁴
29.5	29.102 ⁷³	63.93 ¹⁶⁰	56.222 ¹¹⁰	48.66 ⁹⁴	18.408 ⁵²	67.19 ²⁶²	27.03 ¹²	26.49 ³³⁷
July 9.4	29.135 ³³	65.43 ¹⁵⁰	56.281 ⁵⁹	49.61 ⁹⁵	18.416 ⁸	69.69 ²⁵⁰	26.79 ²⁴	29.69 ³²⁰
	5	139	7	92	34	230	36	294
19.4	29.130	66.82	56.288	50.53	18.382	71.99	26.43	32.63
29.4	29.086 ⁴⁴	68.03 ¹²¹	56.243 ⁴⁵	51.39 ⁸⁶	18.305 ⁷⁷	74.05 ²⁰⁶	25.98 ⁴⁵	35.27 ²⁶⁴
Aug. 8.4	29.005 ⁸¹	69.10 ¹⁰⁷	56.148 ⁹⁵	52.14 ⁷⁵	18.189 ¹¹⁶	75.82 ¹⁷⁷	25.43 ⁵⁵	37.53 ²²⁶
18.3	28.891 ¹¹⁴	69.97 ⁸⁷	56.010 ¹³⁸	52.76 ⁶²	18.039 ¹⁵⁰	77.28 ¹⁴⁶	24.80 ⁶³	39.37 ¹⁸⁴
28.3	28.750 ¹⁴¹	70.64 ⁶⁷	55.834 ¹⁷⁶	53.21 ⁴⁵	17.860 ¹⁷⁹	78.39 ¹¹¹	24.11 ⁶⁹	40.75 ¹³⁸
	163	47	205	24	202	73	74	90
Sept. 7.3	28.587	71.11	55.629	53.45	17.658	79.12	23.37	41.65
17.3	28.412 ¹⁷⁵	71.37 ²⁶	55.408 ²²¹	53.48 ³	17.442 ²¹⁶	79.48 ³⁶	22.60 ⁷⁷	42.03 ³⁸
27.2	28.233 ¹⁷⁹	71.42 ⁵	55.181 ²²⁷	53.27 ²¹	17.222 ²²⁰	79.42 ⁶	21.82 ⁷⁸	41.89 ¹⁴
Oct. 7.2	28.060 ¹⁷³	71.25 ¹⁷	54.962 ²¹⁹	52.84 ⁴³	17.008 ²¹⁴	78.98 ⁴⁴	21.05 ⁷⁷	41.22 ⁶⁷
17.2	27.903 ¹⁵⁷	70.87 ³⁸	54.763 ¹⁹⁹	52.17 ⁶⁷	16.808 ²⁰⁰	78.14 ⁸⁴	20.32 ⁷³	40.03 ¹¹⁹
	133	62	166	84	174	124	68	170
27.1	27.770	70.25	54.597	51.33	16.634	76.90	19.64	38.33
Nov. 6.1	27.670 ¹⁰⁰	69.42 ⁸³	54.474 ¹²³	50.33 ¹⁰⁰	16.493 ¹⁴¹	75.28 ¹⁶²	19.03 ⁶¹	36.16 ²¹⁷
16.1	27.610 ⁶⁰	68.37 ¹⁰⁵	54.403 ⁷¹	49.21 ¹¹²	16.393 ¹⁰⁰	73.32 ¹⁹⁶	18.52 ⁵¹	33.56 ²⁸⁰
26.1	27.594 ¹⁶	67.12 ¹²⁵	54.390 ¹³	48.02 ¹¹⁹	16.341 ⁵²	71.06 ²²⁶	18.12 ⁴⁰	30.58 ²⁹⁶
Dec. 6.0	27.624 ³⁰	65.69 ¹⁴³	54.440 ⁵⁰	46.85 ¹¹⁷	16.337 ⁴	68.54 ²⁶²	17.85 ²⁷	27.31 ³³⁷
	77	158	110	115	49	270	14	346
16.0	27.701	64.11	54.550	45.70	16.386	65.84	17.71	23.83
26.0	27.824 ¹²³	62.43 ¹⁶⁸	54.718 ¹⁶⁸	44.63 ¹⁰⁷	16.484 ⁹⁸	63.03 ²⁸¹	17.71 ⁰	20.25 ³⁵⁸
36.0	27.987 ¹⁶³	60.72 ¹⁷¹	54.940 ²²²	43.67 ⁹⁶	16.629 ¹⁴⁵	60.21 ²⁸²	17.85 ¹⁴	16.71 ³⁵⁴
Mean Place	25.276	62.16	50.947	47.32	14.920	64.21	23.585	21.97
Sec δ , Tan δ	1.003	+0.080	1.307	-0.842	1.130	+0.527	3.270	+3.113
$D\psi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.08	0.00	+0.05	0.00	-0.02	+0.01
$D\psi\delta$, $D\omega\delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	γ Ophiuchi. Mag. 3.7			ξ Draconis. Mag. 3.9			δ Herculis. Mag. 5.5			ζ Draconis. Mag. 5.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	17 43		+ 2 44	17 52		+56 52	17 52		+26 3	17 52		+76 58
			"			"			"			"
n. 1.0	46.561		11.95	4.645		62.42	6.102		40.97	60.23		24.18
10.9	46.747	186	10.35	4.813	168	58.97	6.269	167	38.29	60.46	23	20.74
20.9	46.967	220	8.80	5.053	240	55.70	6.474	203	35.75	60.86	40	17.49
30.9	47.212	245	7.36	5.354	301	52.75	6.712	238	33.43	61.42	56	14.56
b. 9.9	47.479	267	6.12	5.709	355	50.23	6.977	265	31.44	62.15	73	12.06
		280			397			285			83	
19.8	47.759		5.11	6.106		48.23	7.262		29.84	62.98		10.06
ur. 1.8	48.047	288	4.39	6.533	427	46.83	7.560	298	28.71	63.90	92	8.87
11.8	48.339	292	3.98	6.979	446	46.07	7.866	306	28.09	64.87	97	7.92
21.7	48.632	293	3.91	7.430	451	45.97	8.174	308	28.00	65.86	99	7.83
31.7	48.919	287	4.18	7.873	443	46.55	8.477	303	28.44	66.85	99	8.42
		280			428			295			93	
ur. 10.7	49.199		4.77	8.301		47.76	8.772		29.38	67.78		9.63
20.7	49.467	268	5.63	8.700	399	49.54	9.054	282	30.79	68.64	86	11.42
30.6	49.718	251	6.75	9.061	361	51.84	9.316	262	32.60	69.39	75	13.72
ay 10.6	49.950	232	8.05	9.376	315	54.56	9.556	240	34.74	70.01	62	16.45
20.6	50.158	208	9.50	9.637	261	57.62	9.768	212	37.12	70.50	49	19.50
		182			202			179			33	
30.6	50.340		11.04	9.839		60.89	9.947		39.69	70.83		22.78
ne 9.5	50.490	150	12.62	9.976	137	64.31	10.092	145	42.35	70.99	16	26.18
19.5	50.605	115	14.19	10.047	71	67.74	10.198	106	45.03	70.99	0	29.63
29.5	50.683	78	15.70	10.049	2	71.13	10.261	63	47.64	70.81	18	33.01
ly 9.4	50.723	40	17.13	9.984	65	74.36	10.281	20	50.14	70.48	33	36.25
		1			132			22			49	
19.4	50.724		18.44	9.852		77.37	10.259		52.46	69.99		39.25
29.4	50.685	39	19.59	9.656	196	80.08	10.194	65	54.54	69.36	63	41.97
ig. 8.4	50.608	77	20.58	9.403	253	82.45	10.089	105	56.36	68.61	75	44.34
18.3	50.498	110	21.40	9.099	304	84.41	9.950	139	57.86	67.75	86	46.30
28.3	50.361	137	22.03	8.753	346	85.92	9.780	170	59.02	66.80	95	47.81
		161			377			194			102	
pt. 7.3	50.200		22.49	8.376		86.96	9.586		59.83	65.78		48.85
17.3	50.027	173	22.74	7.977	399	87.50	9.376	210	60.27	64.72	106	49.39
27.2	49.849	178	22.80	7.571	406	87.51	9.162	214	60.32	63.64	108	49.42
st. 7.2	49.676	173	22.65	7.170	401	87.00	8.952	210	59.98	62.57	107	48.91
17.2	49.519	135	22.31	6.787	383	85.98	8.754	198	59.25	61.54	103	47.89
					350			173			97	
27.1	49.384		21.77	6.437		84.45	8.581		58.14	60.57		46.38
iv. 6.1	49.283	101	21.01	6.130	307	82.44	8.438	143	56.66	59.69	88	44.38
16.1	49.221	62	20.05	5.880	250	79.98	8.336	102	54.84	58.94	75	41.93
26.1	49.202	19	18.90	5.695	185	77.14	8.279	57	52.71	58.33	61	39.10
sc. 6.0	49.230	28	17.58	5.582	113	73.98	8.271	8	50.34	57.87	46	35.95
		75			35			42			27	
16.0	49.305		16.12	5.547		70.60	8.313		47.76	57.60		32.59
26.0	49.425	120	14.56	5.591	44	67.09	8.403	90	45.07	57.51	9	29.08
36.0	49.586	161	12.95	5.711	120	63.57	8.540	137	42.35	57.62	11	25.60
n Place	46.820		13.88	6.722		66.63	6.731		44.07	67.109		28.36
δ , Tan δ	1.001		+0.048	1.830		+1.533	1.113		+0.489	4.437		+4.323
δ , D α	+0.06		0.00	+0.02		0.00	+0.05		0.00	-0.05		+0.01
δ , D β	0.0		-1.0	0.0		-1.0	0.0		-1.0	0.0		-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Herculis. Mag. 4.0		ν Ophiuchi. Mag. 3.5		ξ Herculis. Mag. 3.8		γ Draconis. Mag. 2.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 53	° ' +37 15	h m 17 54	° ' - 9 45	h m 17 54	° ' +29 15	h m 17 54	° ' +51 29
	s	"	s	"	s	"	s	"
Jan. 1.0	25.485	34.82	30.508	53.22	34.002	18.33	40.458	49.03
10.9	25.646 ¹⁶¹	31.76 ³⁰⁶	30.696 ¹⁸⁸	54.09 ⁸⁷	34.165 ¹⁶³	15.53 ²⁸⁰	40.619 ¹⁶¹	45.64 ³³⁹
20.9	25.854 ²⁰⁸	28.85 ²⁹¹	30.918 ²²²	54.96 ⁸⁷	34.369 ²⁰⁴	12.87 ²⁶⁶	40.841 ²²²	42.43 ³²¹
30.9	26.102 ²⁴⁸	26.21 ²⁰⁴	31.167 ²⁴⁹	55.78 ⁸²	34.606 ²³⁷	10.45 ²⁴²	41.117 ²⁷⁶	39.52 ²⁹¹
Feb. 9.9	26.380 ²⁷⁸	23.94 ²²⁷	31.436 ²⁶⁹	56.50 ⁷²	34.872 ²⁶⁶	8.36 ²⁰⁹	41.439 ³²²	37.02 ²⁵⁰
	305	180	284	61	288	167	358	199
19.8	26.685	22.14	31.720	57.11	35.160	6.69	41.797	35.03
Mar. 1.8	27.006 ³²¹	20.86 ¹²⁸	32.015 ²⁹⁵	57.54 ⁴³	35.463 ³⁰³	5.51 ¹¹⁸	42.180 ³⁸³	33.63 ¹⁴⁰
11.8	27.337 ³³¹	20.15 ⁷¹	32.315 ³⁰⁰	57.77 ²³	35.774 ³¹¹	4.85 ⁶⁶	42.580 ⁴⁰⁰	32.84 ⁷⁹
21.8	27.672 ³³⁵	20.05 ¹⁰	32.615 ³⁰⁰	57.80 ³	36.087 ³¹³	4.74 ¹¹	42.985 ⁴⁰⁵	32.71 ¹³
31.7	28.003 ³³¹	20.55 ⁵⁰	32.913 ²⁹⁸	57.61 ¹⁹	36.397 ³¹⁰	5.18 ⁴⁴	43.384 ³⁹⁹	33.25 ⁵⁴
	321	105	292	38	301	98	386	116
Apr. 10.7	28.324	21.60	33.205	57.23	36.698	6.16	43.770	34.41
20.7	28.627 ³⁰³	23.19 ¹⁵⁹	33.487 ²⁸²	56.68 ⁵⁵	36.986 ²⁸⁸	7.61 ¹⁴⁵	44.132 ³⁶²	36.13 ¹⁷²
30.6	28.909 ²⁸²	25.23 ²⁰⁴	33.756 ²⁶⁹	55.96 ⁷²	37.253 ²⁶⁷	9.47 ¹⁸⁶	44.464 ³³²	38.36 ²²³
May 10.6	29.162 ²⁵³	27.64 ²⁴¹	34.005 ²⁴⁹	55.14 ⁸²	37.498 ²⁴⁵	11.69 ²²²	44.756 ²⁹²	41.01 ²⁶⁵
20.6	29.382 ²²⁰	30.36 ²⁷²	34.233 ²²⁸	54.25 ⁸⁹	37.713 ²¹⁵	14.18 ²⁴⁹	45.003 ²⁴⁷	44.00 ²⁹⁹
	184	291	201	93	183	267	196	320
30.6	29.566	33.27	34.434	53.32	37.896	16.85	45.199	47.20
June 9.5	29.707 ¹⁴¹	36.31 ³⁰⁴	34.604 ¹⁷⁰	52.39 ⁹³	38.041 ¹⁴⁵	19.63 ²⁷⁸	45.339 ¹⁴⁰	47.20 ³³⁴
19.5	29.804 ⁹⁷	39.35 ³⁰⁴	34.741 ¹³⁷	51.49 ⁹⁰	38.146 ¹⁰⁵	22.43 ²⁸⁰	45.422 ⁸³	50.54 ³³⁷
29.5	29.854 ⁵⁰	42.36 ³⁰¹	34.839 ⁹⁸	50.64 ⁸⁵	38.209 ⁶³	25.17 ²⁷⁴	45.445 ²³	53.91 ³³³
July 9.4	29.855 ¹	45.23 ²⁸⁷	34.897 ⁵⁸	49.85 ⁷⁹	38.227 ¹⁸	27.80 ²⁶³	45.407 ³⁸	57.24 ³¹⁷
	46	266	17	68	26	244	98	297
19.4	29.809	47.89	34.914	49.17	38.201	30.24	45.309	63.38
29.4	29.717 ⁹²	50.30 ²⁴¹	34.889 ²⁵	48.57 ⁶⁰	38.132 ⁶⁹	32.43 ²¹⁹	45.156 ¹⁵³	66.06 ²⁶⁸
Aug. 8.4	29.582 ¹³⁵	52.40 ²¹⁰	34.825 ⁶⁴	48.06 ⁵¹	38.021 ¹¹¹	34.35 ¹⁹²	44.950 ²⁰⁶	68.41 ²³⁵
18.3	29.407 ¹⁷⁵	54.14 ¹⁷⁴	34.727 ⁹⁶	47.64 ⁴²	37.876 ¹⁴⁶	35.94 ¹⁵⁹	44.697 ²⁵³	70.35 ¹⁹⁴
28.3	29.200 ²⁰⁷	55.49 ¹³⁵	34.597 ¹³⁰	47.31 ³³	37.698 ¹⁷⁸	37.18 ¹²⁴	44.406 ²⁹¹	71.87 ¹⁵²
	231	95	154	24	202	87	320	105
Sept. 7.3	28.969	56.44	34.443	47.07	37.496	38.05	44.086	72.92
17.3	28.721 ²⁴⁸	56.95 ⁵¹	34.273 ¹⁷⁰	46.90 ¹⁷	37.278 ²¹⁸	38.53 ⁴⁸	43.746 ³⁴⁰	73.48 ⁵⁶
27.2	28.466 ²⁵⁵	57.00 ⁵	34.097 ¹⁷⁶	46.80 ¹⁰	37.054 ²²⁴	38.59 ⁶	43.398 ³⁴⁸	73.54 ⁶
Oct. 7.2	28.215 ²⁵¹	56.60 ⁴⁰	33.924 ¹⁷³	46.79 ¹	36.833 ²²¹	38.25 ³⁴	43.054 ³⁴⁴	73.07 ⁴⁷
17.2	27.978 ²³⁷	55.74 ⁸⁶	33.766 ¹⁵⁸	46.85 ⁶	36.626 ²⁰⁷	37.50 ⁷⁵	42.726 ³²⁸	72.11 ⁹⁶
	211	131	136	16	184	116	299	146
27.1	27.767	54.43	33.630	47.01	36.442	36.34	42.427	70.65
Nov. 6.1	27.589 ¹⁷⁸	52.71 ¹⁷²	33.527 ¹⁰³	47.28 ²⁷	36.290 ¹⁵²	34.80 ¹⁵⁴	42.168 ²⁵⁹	68.71 ¹⁹⁴
16.1	27.454 ¹³⁵	50.58 ²¹³	33.464 ⁶³	47.64 ³⁶	36.179 ¹¹¹	32.90 ¹⁹⁰	41.959 ²⁰⁹	66.34 ²³⁷
26.1	27.368 ⁸⁶	48.10 ²⁴⁸	33.444 ²⁰	48.12 ⁴⁸	36.113 ⁶⁶	30.68 ²²²	41.808 ¹⁵¹	63.58 ²⁷⁶
Dec. 6.0	27.334 ³⁴	45.35 ²⁷⁵	33.471 ²⁷	48.71 ⁵⁹	36.096 ¹⁷	28.19 ²⁴⁹	41.723 ⁸⁵	60.51 ³⁰⁷
	21	297	74	71	34	269	19	330
16.0	27.355	42.38	33.545	49.42	36.130	25.50	41.704	57.21
26.0	27.431 ⁷⁶	39.28 ³¹⁰	33.665 ¹²⁰	50.21 ⁷⁹	36.216 ⁸⁶	22.69 ²⁸¹	41.756 ⁵²	53.78 ³⁴³
36.0	27.561 ¹⁸⁰	36.17 ³¹¹	33.827 ¹⁶²	51.06 ⁸⁵	36.349 ¹³³	19.85 ²⁸⁴	41.876 ¹²⁰	50.34 ³⁴⁴
Mean Place	26.434	38.34	30.696	52.53	34.709	21.40	42.110	52.87
Sec δ , Tan δ	1.257	+0.761	1.015	-0.172	1.146	+0.560	1.606	+1.257
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.04	0.00	+0.07	0.00	+0.05	0.00	+0.03	0.00
$D_{\psi} \delta$, $D_{\omega} \delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	67 Ophiuchi. Mag. 3.9		θ Aræ. Mag. 3.9		γ Sagittarii. Mag. 3.1		70 Ophiuchi. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 56	° ' " + 2 55	h m 18 0	° ' " -50 5	h m 18 0	° ' " -30 25	h m 18 1	° ' " + 2 30
	s	"	s	"	s	"	s	"
Jan. 1.0	32.028	62.85	14.393	52.89	32.140	33.98	18.312	61.55
10.9	32.204 ¹⁷⁶	61.27 ¹⁵⁸	14.660 ²⁶⁷	51.33 ¹⁵⁶	32.352 ²¹²	33.59 ³⁹	18.483 ¹⁷¹	59.98 ¹⁵⁷
20.9	32.412 ²⁰⁸	59.74 ¹⁵³	14.980 ³²⁰	49.93 ¹⁴⁰	32.602 ²⁵⁰	33.26 ³³	18.689 ²⁰⁶	58.45 ¹⁵³
30.9	32.648 ²³⁶	58.32 ¹⁴²	15.343 ³⁶³	48.72 ¹²¹	32.883 ²⁸¹	33.02 ²⁴	18.922 ²³³	57.04 ¹⁴¹
Feb. 9.9	32.906 ²⁵⁸	57.09 ¹²³	15.741 ³⁹⁸	47.70 ¹⁰²	33.189 ³⁰⁶	32.82 ²⁰	19.178 ²⁵⁰	55.80 ¹²⁴
	274	100	423	80	323	15	271	99
19.8	33.180	56.09	16.164	46.90	33.512	32.67	19.449	54.81
Mar. 1.8	33.464 ²⁸⁴	55.39 ⁷⁰	16.605 ⁴⁴¹	46.31 ⁵⁹	33.848 ³³⁶	32.56 ¹¹	19.732 ²⁸³	54.08 ⁷³
11.8	33.754 ²⁹⁰	55.00 ³⁹	17.056 ⁴⁵¹	45.92 ³⁹	34.190 ³⁴²	32.46 ¹⁰	20.022 ²⁹⁰	53.68 ⁴⁰
21.8	34.046 ²⁹²	54.94 ⁶	17.510 ⁴⁵⁴	45.76 ¹⁶	34.535 ³⁴⁵	32.37 ⁹	20.314 ²⁹²	53.59 ⁹
31.7	34.336 ²⁹⁰	55.23 ²⁹	17.961 ⁴⁵¹	45.81 ⁵	34.878 ³⁴³	32.29 ⁸	20.605 ²⁹¹	53.85 ²⁶
	284	61	442	25	337	7	286	57
Apr. 10.7	34.620	55.84	18.403	46.06	35.215	32.22	20.891	54.42
20.7	34.893 ²⁷³	56.72 ⁸⁸	18.830 ⁴²⁷	46.50 ⁴⁴	35.542 ³²⁷	32.18 ⁴	21.167 ²⁷⁶	55.27 ⁸⁶
30.6	35.153 ²⁸⁰	57.87 ¹¹⁵	19.236 ⁴⁰⁶	47.14 ⁶⁴	35.853 ³¹¹	32.16 ²	21.428 ²⁶¹	56.38 ¹¹¹
May 10.6	35.394 ²⁴¹	59.22 ¹³⁵	19.615 ³⁷⁹	47.96 ⁸²	36.146 ²⁹³	32.19 ³	21.673 ²⁴⁵	57.69 ¹³¹
20.6	35.613 ²¹⁹	60.70 ¹⁴⁸	19.959 ³⁴⁴	48.95 ⁹⁹	36.413 ²⁶⁷	32.27 ⁸	21.895 ²²²	59.15 ¹⁴⁶
	191	159	303	116	239	15	197	154
30.6	35.804	62.29	20.262	50.11	36.652	32.42	22.092	60.69
June 9.5	35.965 ¹⁶¹	63.91 ¹⁶²	20.518 ²⁵⁶	51.39 ¹²⁸	36.855 ²⁰³	32.65 ²³	22.258 ¹⁶⁶	62.28 ¹⁵⁹
19.5	36.092 ¹²⁷	65.53 ¹⁶²	20.720 ²⁰²	52.77 ¹³⁸	37.019 ¹⁶⁴	32.93 ²⁸	22.390 ¹³²	63.86 ¹⁵⁸
29.5	36.182 ⁹⁰	67.09 ¹⁵⁶	20.864 ¹⁴⁴	54.22 ¹⁴⁵	37.141 ¹²²	33.28 ³⁵	22.485 ⁹⁵	65.38 ¹⁵²
July 9.5	36.233 ⁵¹	68.56 ¹⁴⁷	20.948 ⁸⁴	55.70 ¹⁴⁸	37.216 ⁷⁵	33.67 ³⁹	22.541 ⁵⁶	66.82 ¹⁴⁴
	10	136	21	145	28	43	15	130
19.4	36.243	69.92	20.969	57.15	37.244	34.10	22.556	68.12
29.4	36.213 ³⁰	71.11 ¹¹⁹	20.926 ⁴³	58.53 ¹³⁸	37.224 ²⁰	34.54 ⁴⁴	22.530 ²⁶	69.29 ¹¹⁷
Aug. 8.4	36.144 ⁶⁹	72.16 ¹⁰⁵	20.824 ¹⁰²	59.77 ¹²⁴	37.157 ⁶⁷	34.95 ⁴¹	22.466 ⁶⁴	70.29 ¹⁰⁰
18.3	36.041 ¹⁰³	73.02 ⁸⁶	20.667 ¹⁵⁷	60.85 ¹⁰⁸	37.049 ¹⁰⁸	35.32 ³⁷	22.368 ⁹⁸	71.12 ⁸³
28.3	35.908 ¹³³	73.70 ⁶⁸	20.463 ²⁰⁴	61.70 ⁸⁵	36.906 ¹⁴³	35.61 ²⁹	22.238 ¹³⁰	71.77 ⁶⁵
	157	49	241	58	172	18	154	46
Sept. 7.3	35.751	74.19	20.222	62.28	36.734	35.79	22.084	72.23
17.3	35.581 ¹⁷⁰	74.47 ²⁸	19.955 ²⁶⁷	62.56 ²⁸	36.542 ¹⁹²	35.86 ⁷	21.913 ¹⁷¹	72.50 ²⁷
27.2	35.402 ¹⁷⁹	74.57 ¹⁰	19.878 ²⁷⁷	62.52 ⁴	36.343 ¹⁹⁹	35.80 ⁶	21.736 ¹⁷⁷	72.58 ⁸
Oct. 7.2	35.227 ¹⁷⁵	74.47 ¹⁰	19.404 ²⁷⁴	62.14 ³⁸	36.146 ¹⁹⁷	35.60 ²⁰	21.561 ¹⁷⁵	72.45 ¹³
17.2	35.065 ¹⁶²	74.14 ³⁸	19.149 ²⁵⁵	61.43 ⁷¹	35.963 ¹⁸³	35.27 ³³	21.398 ¹⁶³	72.13 ³²
	140	51	220	100	156	44	142	52
27.2	34.925	73.63	18.929	60.43	35.807	34.83	21.256	71.61
Nov. 6.1	34.816 ¹⁰⁹	72.90 ⁷³	18.755 ¹⁷⁴	59.16 ¹²⁷	35.688 ¹¹⁹	34.30 ⁵³	21.146 ¹¹⁰	70.88 ⁷³
16.1	34.744 ⁷²	71.97 ⁹³	18.639 ¹¹⁶	57.69 ¹⁴⁷	35.612 ⁷⁶	33.71 ⁵⁹	21.072 ⁷⁴	69.95 ⁹³
26.1	34.715 ²⁹	70.85 ¹¹²	18.589 ⁵⁰	56.05 ¹⁶⁴	35.586 ²⁶	33.08 ⁶³	21.039 ³³	68.84 ¹¹¹
Dec. 6.0	34.732 ¹⁷	69.56 ¹²⁹	18.608 ¹⁹	54.32 ¹⁷³	35.613 ²⁷	32.47 ⁶¹	21.052 ¹³	67.56 ¹²⁸
	63	143	92	175	81	59	59	144
16.0	34.795	68.13	18.700	52.57	35.694	31.88	21.111	66.12
26.0	34.902 ¹⁰⁷	66.80 ¹⁵³	18.860 ¹⁶⁰	50.86 ¹⁷¹	35.827 ¹³³	31.36 ⁵²	21.214 ¹⁰³	64.59 ¹⁵³
36.0	35.050 ¹⁴⁸	65.02 ¹⁵⁸	19.085 ²²⁵	49.24 ¹⁶²	36.007 ¹⁸⁰	30.90 ⁴⁶	21.359 ¹⁴⁵	63.02 ¹⁵⁷
Mean Place	32.307	64.34	14.836	54.82	32.334	34.71	18.591	62.86
Sec δ , Tan δ	1.001	+0.051	1.559	-1.196	1.160	-0.587	1.001	+0.044
$D\psi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.09	0.00	+0.08	0.00	+0.06	0.00
$D\psi\delta$, $D\omega\delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	72 Ophiuchi. Mag. 3.7		O Herculis. Mag. 3.8		μ Sagittarii. Mag. 4.0		γ Sagittarii. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 3	" + 9 32	h m 18 4	" + 28 44	h m 18 8	" - 21 4	h m 18 12	" - 36 47
	s	"	s	"	s	"	s	"
Jan. 1.0	27.334	63.21	19.891	58.99	51.352	52.96	4.506	13.37
11.0	27.498	61.30	20.044	56.21	51.539	53.08	4.718	12.52
20.9	27.697	59.46	20.237	53.57	51.764	53.23	4.971	11.76
30.9	27.924	57.77	20.466	51.14	52.018	53.40	5.259	11.10
Feb. 9.9	28.175	56.30	20.724	49.04	52.294	53.56	5.577	10.52
19.8	28.443	55.11	21.004	47.34	52.589	53.68	5.915	10.04
Mar. 1.8	28.724	54.27	21.301	46.11	52.897	53.74	6.269	9.65
11.8	29.013	53.79	21.609	45.40	53.212	53.72	6.633	9.33
21.8	29.304	53.71	21.921	45.24	53.531	53.61	7.000	9.10
31.7	29.595	54.04	22.232	45.63	53.849	53.40	7.368	8.83
Apr. 10.7	29.880	54.75	22.535	46.55	54.162	53.12	7.732	8.85
20.7	30.155	55.80	22.827	47.94	54.467	52.76	8.085	8.85
30.7	30.416	57.14	23.101	49.77	54.761	52.36	8.425	8.94
May 10.6	30.660	58.75	23.353	51.96	55.037	51.94	8.745	9.14
20.6	30.880	60.53	23.576	54.40	55.291	51.52	9.039	9.43
30.6	31.075	62.44	23.768	57.07	55.520	51.12	9.303	9.83
June 9.5	31.238	64.41	23.924	59.83	55.716	50.76	9.531	10.34
19.5	31.366	66.38	24.039	62.64	55.876	50.46	9.719	10.94
29.5	31.457	68.31	24.112	65.40	55.997	50.24	9.859	11.63
July 9.5	31.507	70.14	24.140	68.05	56.076	50.07	9.950	12.37
19.4	31.517	71.83	24.124	70.52	56.110	49.97	9.990	13.14
29.4	31.486	73.36	24.064	72.77	56.099	49.93	9.978	13.91
Aug. 8.4	31.416	74.69	23.962	74.74	56.045	49.92	9.916	14.63
18.4	31.310	75.80	23.823	76.39	55.953	49.94	9.807	15.29
28.3	31.174	76.68	23.651	77.71	55.824	49.97	9.657	15.84
Sept. 7.3	31.014	77.30	23.455	78.66	55.668	49.99	9.476	16.24
17.3	30.837	77.69	23.240	79.22	55.494	49.98	9.270	16.45
27.2	30.653	77.81	23.017	79.37	55.310	49.93	9.054	16.49
Oct. 7.2	30.471	77.66	22.796	79.12	55.127	49.85	8.839	16.32
17.2	30.301	77.27	22.588	78.46	54.957	49.73	8.636	15.95
27.2	30.152	76.60	22.401	77.40	54.809	49.58	8.459	15.40
Nov. 6.1	30.032	75.68	22.245	75.96	54.694	49.42	8.318	14.68
16.1	29.950	74.50	22.127	74.14	54.618	49.27	8.225	13.84
26.1	29.908	73.11	22.053	71.99	54.588	49.14	8.180	12.91
Dec. 6.1	29.912	71.50	22.028	69.58	54.606	49.06	8.193	11.93
16.0	29.962	69.74	22.053	66.95	54.673	49.04	8.263	10.94
26.0	30.055	67.87	22.127	64.19	54.789	49.07	8.389	9.98
36.0	30.192	65.95	22.250	61.39	54.946	49.16	8.567	9.09
Mean Place	27.691	64.80	20.598	61.33	51.530	53.07	4.755	14.24
Sec δ , Tan δ	1.014	+0.168	1.141	+0.549	1.072	-0.385	1.249	-0.748
$D\psi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.05	0.00	+0.07	0.00	+0.08	0.00
$D\psi\delta$, $D\omega\delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington on Time.	Groombridge 2533. Mag. 5.4		36 Draconis. Mag. 5.0		δ Sagittarii. Mag. 2.8		γ Serpentis. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 13	° ' " +42 7	h m 18 13	° ' " +64 21	h m 18 15	° ' " -29 51	h m 18 17	° ' " - 2 55
n. 1.0	4.554	48.75	22.48	67.54	44.459	50.52	3.704	16.24
11.0	4.690 ¹³⁶	45.56 ³¹⁹	22.61 ¹⁸	64.04 ³⁵⁰	44.654 ¹⁹⁵	50.06 ⁴⁶	3.863 ¹⁵⁹	17.44 ¹²⁰
20.9	4.878 ¹⁸⁸	42.50 ³⁰⁶	22.83 ²²	60.67 ³³⁷	44.886 ²³²	49.67 ³⁹	4.057 ¹⁹⁴	18.61 ¹¹⁷
30.9	5.111 ²³³	39.69 ²⁸¹	23.14 ³¹	57.58 ³⁰⁹	45.152 ²⁶⁶	49.33 ³⁴	4.280 ²²³	19.71 ¹¹⁰
b. 9.9	5.383 ³⁷²	37.23 ²⁴⁶	23.54 ⁴⁰	54.87 ²⁷¹	45.444 ²⁹²	49.04 ²⁹	4.526 ²⁴⁶	20.67 ⁹⁶
	303	200	45	223	314	26	264	76
19.8	5.686	35.23	23.99	52.64	45.758	48.78	4.790	21.43
ar. 1.8	6.012 ³²⁶	33.75 ¹⁴⁸	24.48 ⁴⁹	50.99 ¹⁶⁵	46.084 ³²⁶	48.54 ²⁴	5.069 ²⁷⁹	21.98 ⁵⁵
11.8	6.354 ³⁴²	32.87 ⁸⁸	25.01 ⁵³	49.98 ¹⁰¹	46.420 ³³⁶	48.31 ²³	5.355 ²⁸⁶	22.26 ²⁸
21.8	6.706 ³⁵²	32.59 ²⁸	25.56 ⁵⁵	49.63 ³⁵	46.761 ³⁴¹	48.08 ²³	5.647 ²⁹²	22.27 ¹
31.7	7.056 ³⁵⁰	32.92 ³³	26.11 ⁵⁵	49.95 ³²	47.103 ³⁴²	47.86 ²²	5.939 ²⁹²	21.99 ²⁸
	344	95	54	96	338	22	290	54
pr. 10.7	7.400	33.87	26.65	50.93	47.441	47.64	6.229	21.45
20.7	7.730 ³³⁰	35.36 ¹⁴⁹	27.15 ⁵⁰	52.51 ¹⁵⁸	47.772 ³³¹	47.45 ¹⁹	6.512 ²⁸³	20.67 ⁷⁸
30.7	8.038 ³⁰⁸	37.36 ²⁰⁰	27.61 ⁴⁶	54.64 ²¹³	48.090 ³¹⁸	47.28 ¹⁷	6.784 ²⁷²	19.68 ⁹⁹
ay 10.6	8.319 ²⁸¹	39.78 ²⁴²	28.02 ⁴¹	57.24 ²⁶⁰	48.389 ²⁹⁹	47.16 ¹²	7.040 ²⁶⁶	18.52 ¹¹⁶
20.6	8.566 ²⁴⁷	42.53 ²⁷⁵	28.35 ³³	60.22 ²⁹⁸	48.668 ²⁷⁹	47.11 ⁵	7.277 ²³⁷	17.26 ¹²⁶
	308	300	27	325	250	1	212	134
30.6	8.774 ¹⁶⁴	45.53 ³¹⁶	28.62 ¹⁹	63.47 ³⁴³	48.918 ²¹⁷	47.12 ¹⁰	7.489 ¹⁸³	15.92 ¹³⁶
ne 9.5	8.938 ¹¹⁶	48.69 ³²²	28.81 ¹⁰	66.90 ³⁵³	49.135 ¹⁷⁹	47.22 ¹⁹	7.672 ¹⁴⁹	14.56 ¹³⁵
19.5	9.054 ⁶⁶	51.91 ³²⁰	28.91 ²	70.43 ³⁴⁹	49.314 ¹³⁰	47.41 ²⁷	7.821 ¹¹²	13.21 ¹²⁹
29.5	9.120 ¹⁵	55.11 ³⁰⁹	28.93 ⁷	73.92 ³⁴⁰	49.450 ⁹⁶	47.68 ³⁴	7.933 ⁷²	11.92 ¹¹⁹
ly 9.5	9.135 ³⁸	58.20 ²⁹²	28.86 ¹⁷	77.32 ³²¹	49.540 ⁴⁴	48.02 ³⁸	8.005 ³¹	10.73 ¹⁰⁹
19.4	9.097 ⁸⁹	61.12 ²⁶⁶	28.69 ²³	80.53 ²⁹⁵	49.584 ⁵	48.40 ⁴²	8.036 ¹¹	9.64 ⁹⁷
29.4	9.008 ¹³⁷	63.78 ²³⁷	28.46 ³¹	83.48 ²⁶²	49.579 ⁵²	48.82 ⁴²	8.025 ⁵¹	8.67 ⁸³
ig. 8.4	8.871 ¹⁸⁰	66.15 ²⁰¹	28.15 ³⁸	86.10 ²²⁵	49.527 ⁹⁵	49.24 ³⁹	7.974 ⁸⁸	7.84 ⁶⁷
18.4	8.691 ²¹⁸	68.16 ¹⁶²	27.77 ⁴⁴	88.35 ¹⁸²	49.432 ¹³⁴	49.63 ³⁴	7.886 ¹²¹	7.17 ⁵³
28.3	8.473 ²⁴⁷	69.78 ¹²⁰	27.33 ⁴⁸	90.17 ¹³⁴	49.298 ¹⁶⁵	49.97 ²⁴	7.765 ¹⁴⁸	6.64 ³⁸
pt. 7.3	8.226 ²⁶⁸	70.98 ⁷⁵	26.85 ⁵¹	91.51 ⁸⁶	49.133 ¹⁸⁶	50.21 ¹⁵	7.617 ¹⁶⁶	6.26 ²³
17.3	7.958 ²⁷⁸	71.73 ²⁷	26.34 ⁵³	92.37 ³³	48.947 ¹⁹⁸	50.36 ³	7.451 ¹⁷⁶	6.03 ¹⁰
27.2	7.680 ²⁷⁸	72.00 ²⁰	25.81 ⁵²	92.70 ²⁰	48.749 ¹⁹⁸	50.39 ¹⁰	7.275 ¹⁷⁷	5.93 ⁵
st. 7.2	7.402 ²⁶⁸	71.80 ⁶⁸	25.29 ⁵²	92.50 ⁷³	48.551 ¹⁸⁷	50.29 ²⁴	7.098 ¹⁶⁵	5.98 ²¹
17.2	7.134 ²⁴⁵	71.12 ¹¹⁶	24.77 ⁴⁸	91.77 ¹²⁶	48.364 ¹⁶²	50.05 ³⁵	6.933 ¹⁴⁷	6.19 ³⁵
27.2	6.889 ²¹³	69.96 ¹⁶²	24.29 ⁴⁴	90.51 ¹⁷⁷	48.202 ¹³⁰	49.70 ⁴⁵	6.786 ¹²⁰	6.54 ⁴⁹
iv. 6.1	6.676 ¹⁷²	68.34 ²⁰⁴	23.85 ³⁸	88.74 ²²⁵	48.072 ⁸³	49.25 ⁵³	6.666 ⁸²	7.03 ⁶⁶
16.1	6.504 ¹²³	66.30 ²⁴³	23.47 ³⁰	86.49 ²⁶⁷	47.984 ⁴⁰	48.72 ⁵⁸	6.584 ⁴³	7.69 ⁸⁰
26.1	6.381 ⁷¹	63.87 ²⁷⁵	23.17 ²¹	83.82 ³⁰³	47.944 ¹¹	48.14 ⁵⁹	6.541 ²	8.49 ⁹³
xc. 6.1	6.310 ¹³	61.12 ³⁰¹	22.96 ¹²	80.79 ³³⁰	47.955 ⁶⁴	47.55 ⁵⁷	6.543 ⁴⁶	9.42 ¹⁰⁷
16.0	6.297 ⁴⁶	58.11 ³¹⁶	22.84 ³	77.49 ³⁴⁹	48.019 ¹¹⁶	46.98 ⁵⁴	6.589 ⁹¹	10.49 ¹¹⁵
26.0	6.343 ¹⁰¹	54.95 ³²²	22.81 ⁷	74.00 ³⁵²	48.135 ¹⁶³	46.44 ⁴⁹	6.680 ¹³³	11.64 ¹²⁰
36.0	6.444	51.73	22.88	70.48	48.298	45.95	6.813	12.84
Place	5.714	50.67	25.496	69.50	44.663	51.00	3.950	15.65
Tan δ	1.348	+0.905	2.312	+2.084	1.153	-0.574	1.001	-0.051
D_{α}	+0.04	0.00	+0.01	-0.01	+0.08	0.00	+0.06	0.00
D_{δ}	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♄ Sagittarii. Mag. 2.0		109 Herculis. Mag. 3.9		α Telescopii. Mag. 3.8		χ Draconis. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 18	° ' " -34 25	h m 18 20	° ' " +21 43	h m 18 20	° ' " -46 0	h m 18 22	° ' " +72 41
Jan. 1.0	43.500	27.42	11.637	51.99	53.232	52.91	27.29	50.16
11.0	43.699 109	26.68 74	11.776 139	49.52 247	53.455 223	51.47 144	27.41 12	46.66 350
20.9	43.940 241	26.02 66	11.955 179	47.14 238	53.729 274	50.13 134	27.65 24	43.27 339
30.9	44.214 274	25.42 60	12.168 213	44.95 219	54.045 316	48.93 120	28.03 38	40.12 315
Feb. 9.9	44.518 304	24.90 52	12.408 240	43.01 194	54.396 351	47.86 107	28.53 50	37.33 279
	325	46	264	157	377	91	59	232
19.9	44.843	24.44	12.672	41.44	54.773	46.95	29.12	35.01
Mar. 1.8	45.183 340	24.04 40	12.952 280	40.28 116	55.171 398	46.22 73	29.80 68	33.24 177
11.8	45.536 353	23.69 35	13.244 292	39.59 69	55.581 410	45.63 59	30.53 73	32.08 116
21.8	45.893 357	23.40 29	13.543 299	39.38 21	56.000 419	45.22 41	31.29 76	31.61 47
31.7	46.251 358	23.16 24	13.844 301	39.68 30	56.420 420	44.98 24	32.07 78	31.79 18
	355	18	297	77	417	8	75	84
Apr. 10.7	46.606	22.98	14.141	40.45	56.837	44.90	32.82	32.63
20.7	46.953 347	22.85 13	14.431 290	41.68 123	57.244 407	45.00 10	33.53 71	34.09 146
30.7	47.288 335	22.80 5	14.707 276	43.30 162	57.635 391	45.28 28	34.18 65	36.10 201
May 10.6	47.605 317	22.84 4	14.964 257	45.24 194	58.006 371	45.73 45	34.75 57	38.60 289
20.6	47.899 294	22.97 13	15.199 235	47.47 223	58.348 342	46.36 63	35.22 47	41.48 265
	264	25	205	240	307	80	37	315
30.6	48.163	23.22	15.404	49.87	58.655	47.16	35.59	44.66
June 9.6	48.393 230	23.56 34	15.577 173	52.38 251	58.920 265	48.10 94	35.84 25	48.05 339
19.5	48.581 183	23.99 43	15.714 137	54.94 256	59.138 218	49.16 106	35.96 12	51.53 348
29.5	48.726 145	24.52 53	15.811 97	57.47 253	59.303 165	50.35 119	35.94 2	55.03 350
July 9.5	48.822 96	25.12 60	15.865 54	59.90 243	59.411 108	51.59 124	35.82 12	58.45 342
	46	64	10	229	48	126	26	325
19.4	48.868	25.76	15.875	62.19	59.459	52.85	35.56	61.70
29.4	48.864 4	26.42 66	15.842 33	64.27 208	59.449 10	54.09 124	35.20 36	64.72 302
Aug. 8.4	48.810 54	27.06 64	15.768 74	66.12 185	59.379 70	55.26 117	34.71 49	67.42 270
18.4	48.710 100	27.65 59	15.655 113	67.68 156	59.257 122	56.31 105	34.14 57	69.77 235
28.3	48.571 139	28.15 50	15.510 145	68.95 127	59.085 172	57.20 89	33.49 65	71.70 199
	174	38	174	95	210	67	72	148
Sept. 7.3	48.397	28.53	15.336	69.90	58.875	57.87	32.77	73.18
17.3	48.201 196	28.76 23	15.145 191	70.50 60	58.638 237	58.29 42	32.01 76	74.18 100
27.3	47.993 208	28.83 7	14.943 203	70.75 25	58.385 253	58.43 14	31.21 80	74.65 47
Oct. 7.2	47.783 210	28.73 10	14.740 202	70.64 11	58.131 254	58.27 16	30.41 80	74.60 58
17.2	47.585 198	28.43 30	14.545 195	70.18 46	57.889 242	57.83 44	29.63 78	74.02 112
	174	45	175	83	214	73	75	
27.2	47.411	27.98	14.370	69.35	57.675	57.10	28.88	72.90
Nov. 6.1	47.271 140	27.39 59	14.222 148	68.17 118	57.500 175	56.13 97	28.19 69	71.27 163
16.1	47.175 96	26.67 72	14.110 112	66.66 151	57.375 125	54.93 120	27.58 61	69.15 212
26.1	47.129 46	25.87 80	14.038 72	64.86 180	57.307 68	53.57 136	27.08 50	66.59 256
Dec. 6.1	47.135 6	25.03 84	14.011 27	62.78 208	57.304 3	52.10 147	26.69 39	63.66 293
	62	84	20	228	60	152	26	324
16.0	47.197	24.19	14.031	60.50	57.364	50.58	26.43	60.42
26.0	47.313 116	23.36 83	14.091 67	58.08 242	57.488 124	49.05 153	26.30 13	56.99 343
36.0	47.479 166	22.57 79	14.209 111	55.61 247	57.672 184	47.57 148	26.32 2	53.46 353
Mean Place	43.736	28.05	12.197	53.07	53.615	53.93	32.273	51.00
Sec δ, Tan δ	1.212	-0.685	1.076	+0.399	1.440	-1.036	3.362	+3.210
D _δ α, D _α α	+0.08	0.00	+0.05	0.00	+0.09	+0.01	-0.02	-0.02
D _δ δ, D _α δ	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	λ Sagittarii. Mag. 2.9		ϵ Serpentis. Mag. 5.4		ι Aquilae. Mag. 4.1		ζ Pavonis. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 22	° ' " -25 28	h m 18 25	° ' " - 2 2	h m 18 30	° ' " - 8 17	h m 18 33	° ' " -71 29
n. 1.0	54.420	5.60	24.660	21.99	44.464	68.84	25.64	60.19
11.0	54.600 ¹⁸⁰	5.39 ²¹	24.811 ¹⁵¹	23.20 ¹²¹	44.616 ¹⁵²	69.67 ⁸³	25.99 ³⁵	57.41 ²⁷⁸
20.9	54.818 ²¹⁸	5.22 ¹⁷	24.998 ¹⁸⁷	24.38 ¹¹⁸	44.803 ¹⁸⁷	70.48 ⁸¹	26.46 ⁴⁷	54.77 ²⁶⁴
30.9	55.068 ²⁵⁰	5.08 ¹⁴	25.214 ²¹⁶	25.47 ¹⁰⁹	45.021 ²¹⁸	71.23 ⁷⁵	27.04 ⁵⁸	52.34 ²⁴³
b. 9.9	55.343 ²⁷⁵	4.94 ¹⁴	25.454 ²⁴⁰	26.42 ⁹⁵	45.263 ²⁴²	71.88 ⁶⁵	27.71 ⁶⁷	50.18 ²¹⁶
	296	14	260	77	262	51	73	186
19.9	55.639	4.80	25.714	27.19	45.525	72.39	28.44	48.32
1r. 1.8	55.950 ³¹¹	4.63 ¹⁷	25.990 ²⁷⁶	27.72 ⁵³	45.802 ²⁷⁷	72.71 ³²	29.24 ⁸⁰	46.81 ¹⁵¹
11.8	56.270 ³²⁰	4.43 ²⁰	26.275 ²⁸⁵	27.98 ²⁶	46.090 ²⁸⁸	72.84 ¹³	30.07 ⁸³	45.66 ¹¹⁵
21.8	56.596 ³²⁶	4.17 ²⁶	26.565 ²⁹⁰	27.96 ²	46.385 ²⁹⁵	72.74 ¹⁰	30.92 ⁸⁵	44.89 ⁷⁷
31.7	56.925 ³²⁹	3.88 ²⁹	26.859 ²⁹⁴	27.65 ³¹	46.682 ²⁹⁷	72.41 ²³	31.79 ⁸⁷	44.51 ³⁸
	326	32	291	59	297	54	86	1
1r. 10.7	57.251	3.56	27.150	27.06	46.979	71.87	32.65	44.50
20.7	57.571 ³²⁰	3.21 ³⁵	27.436 ²⁸⁶	26.23 ⁸³	47.272 ²⁹³	71.14 ⁷³	33.49 ⁸⁴	44.89 ³⁹
30.7	57.879 ³⁰⁸	2.85 ³⁶	27.711 ²⁷⁵	25.17 ¹⁰⁶	47.555 ²⁸³	70.25 ⁸⁹	34.30 ⁸¹	45.65 ⁷⁶
1y 10.6	58.174 ²⁹⁵	2.51 ³⁴	27.973 ²⁶²	23.95 ¹²²	47.825 ²⁷⁰	69.23 ¹⁰²	35.05 ⁷⁵	46.76 ¹¹¹
20.6	58.447 ²⁷³	2.21 ³⁰	28.215 ²⁴²	22.59 ¹³⁶	48.076 ²⁵¹	68.13 ¹¹⁰	35.74 ⁶⁹	48.19 ¹⁴³
	246	24	219	143	229	113	61	175
30.6	58.693	1.97 ¹⁸	28.434	21.16	48.305	67.00	36.35	49.94
ne 9.6	58.908 ²¹⁵	1.79 ¹⁰	28.624 ¹⁹⁰	19.72 ¹⁴⁴	48.504 ¹⁹⁹	65.86 ¹¹⁴	36.87 ⁵²	51.94 ²⁰⁰
19.5	59.088 ¹⁸⁰	1.69 ¹	28.782 ¹⁵⁸	18.27 ¹⁴⁵	48.671 ¹⁶⁷	64.75 ¹¹¹	37.29 ⁴²	54.14 ²²⁰
29.5	59.228 ¹⁴⁰	1.68 ⁸	28.901 ¹¹⁹	16.89 ¹³⁸	48.800 ¹²⁹	63.71 ¹⁰⁴	37.59 ³⁰	56.49 ²³⁵
1y 9.5	59.324 ⁹⁶	1.76 ¹³	28.982 ⁸¹	15.61 ¹²⁸	48.890 ⁹⁰	62.76 ⁹⁵	37.77 ¹⁸	58.92 ²⁴³
	48	19	38	117	48	84	6	244
19.4	59.372	1.89	29.020	14.44	48.938	61.92	37.83	61.36
29.4	59.374 ²	2.08 ¹⁹	29.018 ²	13.40 ¹⁰⁴	48.943 ⁵	61.20 ⁷²	37.75 ⁸	63.73 ²³⁷
1g. 8.4	59.331 ⁴³	2.31 ²³	29.874 ⁴⁴	12.50 ⁹⁰	48.906 ³⁷	60.59 ⁶¹	37.55 ²⁰	65.95 ²²²
18.4	59.244 ⁸⁷	2.54 ²³	28.892 ⁸²	11.75 ⁷⁵	48.829 ⁷⁷	60.10 ⁴⁹	37.24 ³¹	67.93 ¹⁹⁸
28.3	59.120 ¹²⁴	2.76 ²²	28.775 ¹¹⁷	11.16 ⁵⁶	48.717 ¹¹²	59.73 ³⁷	36.83 ⁴¹	69.61 ¹⁶⁸
	155	18	144	43	139	25	49	130
pt. 7.3	58.965	2.94 ¹²	28.631	10.73	48.578	59.48	36.34	70.91
17.3	58.788 ¹⁷⁷	3.06 ⁵	28.467 ¹⁶⁴	10.45 ²⁸	48.416 ¹⁶²	59.32 ¹⁶	35.78 ⁵⁶	71.79 ⁸⁸
27.3	58.599 ¹⁸⁹	3.11 ¹⁴	28.293 ¹⁷⁴	10.33 ¹²	48.243 ¹⁷³	59.26 ⁶	35.18 ⁶⁰	72.18 ³⁹
1t. 7.2	58.409 ¹⁹⁰	3.07 ¹²	28.117 ¹⁷⁶	10.35 ²	48.087 ¹⁷⁶	59.29 ⁸	34.57 ⁶¹	72.07 ¹¹
17.2	58.228 ¹⁸¹	2.95 ¹⁴	27.950 ¹⁶⁷	10.54 ¹⁹	47.900 ¹⁶⁷	59.41 ¹²	33.98 ⁵⁹	71.45 ⁶²
	159	21	150	34	151	22	55	112
27.2	58.069	2.74 ²⁷	27.800	10.88	47.749	59.63	33.43	70.33
iv. 6.1	57.941 ¹²⁸	2.47 ³¹	27.679 ¹²¹	11.38 ⁵⁰	47.626 ¹²³	59.94 ³¹	32.96 ⁴⁷	68.74 ¹⁵⁹
16.1	57.851 ⁹⁰	2.16 ³⁴	27.591 ⁸⁸	12.04 ⁶⁶	47.536 ⁹⁰	60.35 ⁴¹	32.58 ³⁸	66.74 ²⁰⁰
26.1	57.806 ⁴⁵	1.82 ³⁴	27.544 ⁴⁷	12.84 ⁸⁰	47.486 ⁵⁰	60.86 ⁵¹	32.31 ²⁷	64.41 ²³³
1c. 6.1	57.811 ⁵	1.49 ³³	27.538 ⁶	13.79 ⁹⁵	47.480 ⁶	61.47 ⁶¹	32.18 ¹³	61.81 ²⁶⁰
	55	31	39	107	39	72	0	276
16.0	57.866	1.18	27.577	14.86	47.519	62.19	32.18	59.05
26.0	57.969 ¹⁰³	0.90 ²⁸	27.660 ⁸³	16.02 ¹¹⁶	47.602 ⁸³	62.96 ⁷⁷	32.31 ¹³	56.21 ²⁸⁴
36.0	58.119 ¹⁵⁰	0.68 ²²	27.786 ¹²⁶	17.23 ¹²¹	47.728 ¹²⁶	63.77 ⁸¹	32.57 ²⁶	53.38 ²⁸³
Place	54.614	5.84	24.916	21.60	44.684	68.69	27.453	61.45
), Tan δ	1.108	-0.476	1.001	-0.036	1.011	-0.146	3.151	-2.988
, $D_{\infty} \alpha$	+0.07	0.00	+0.06	0.00	+0.06	0.00	+0.14	+0.03
, $D_{\infty} \delta$	0.0	-1.0	0.0	-1.0	+0.1	-1.0	+0.1	-1.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Lyrae. (Vega.) Mag. 0.1			γ Aquilæ. Mag. 4.7			ϕ Sagittarii. Mag. 3.3			η Herculis. Mag. 4.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	18 34		+38 42	18 37		- 9 7	18 40		-27 4	18 42		+20 27
Jan. 1.0	8.697		23.78	46.887		55.39	31.808		34.16	7.363		61.12
11.0	8.810	113	20.73	47.034	147	56.14	31.970	162	33.77	7.481	118	58.76
20.9	8.973	163	17.75	47.215	181	56.86	32.172	202	33.41	7.639	158	56.45
30.9	9.179	206	14.97	47.427	212	57.53	32.408	236	33.07	7.830	191	54.31
Feb. 9.9	9.424	245	12.51	47.664	237	58.11	32.673	265	32.73	8.052	222	52.40
		277			259			287			248	
19.9	9.701		10.46	47.923		58.55	32.960		32.38	8.300		50.81
Mar. 1.8	10.004	303	8.90	48.197	274	58.81	33.266	306	32.02	8.566	266	49.62
11.8	10.326	322	7.89	48.483	286	58.88	33.584	318	31.64	8.848	282	48.87
21.8	10.660	334	7.48	48.777	294	58.72	33.911	327	31.22	9.141	293	48.59
31.8	10.999	339	7.66	49.075	298	58.36	34.242	331	30.78	9.439	298	48.80
		338			298			333			299	
Apr. 10.7	11.337		8.43	49.373		57.80	34.575		30.31	9.738		49.49
20.7	11.665	328	9.76	49.668	295	57.04	34.905	330	29.84	10.032	294	50.62
30.7	11.978	313	11.59	49.956	288	56.13	35.226	321	29.39	10.318	286	52.16
May 10.6	12.269	291	13.86	50.231	275	55.11	35.533	307	28.98	10.588	270	54.02
20.6	12.531	262	16.48	50.487	256	54.01	35.822	289	28.62	10.837	249	56.18
		228			235			264			224	
30.6	12.759		19.36	50.722		52.88	36.086		28.34	11.061		58.53
June 9.6	12.948	189	22.44	50.928	206	51.75	36.321	235	28.15	11.255	194	61.01
19.5	13.091	143	25.60	51.102	174	50.66	36.519	198	28.06	11.412	157	63.54
29.5	13.187	96	28.77	51.240	138	49.63	36.677	158	28.08	11.530	118	66.08
July 9.5	13.232	45	31.86	51.337	97	48.70	36.791	114	28.19	11.606	76	68.53
		4			54			66			33	
19.5	13.228		34.81	51.391		47.88	36.857		28.40	11.639		70.85
29.4	13.173	55	37.55	51.402	11	47.18	36.876	19	28.68	11.627	12	72.98
Aug. 8.4	13.070	103	40.01	51.370	32	46.60	36.847	29	29.00	11.573	54	74.90
18.4	12.922	148	42.15	51.299	71	46.13	36.773	74	29.33	11.479	94	76.55
28.3	12.736	186	43.93	51.192	107	45.78	36.659	114	29.66	11.348	131	77.93
		219			136			148			161	
Sept. 7.3	12.517		45.32	51.056		45.55	36.511		29.96	11.187		78.98
17.3	12.275	242	46.28	50.896	160	45.40	36.337	174	30.18	11.005	182	79.71
27.3	12.018	257	46.78	50.724	172	45.34	36.149	188	30.32	10.808	197	80.10
Oct. 7.2	11.758	260	46.83	50.548	176	45.37	35.955	194	30.37	10.607	201	80.15
17.2	11.506	252	46.40	50.380	168	45.48	35.768	187	30.31	10.412	195	79.84
		236			153			168			180	
27.2	11.270		45.51	50.227		45.68	35.600		30.15	10.232		79.17
Nov. 6.2	11.062	208	44.17	50.100	127	45.96	35.459	141	29.88	10.077	155	78.18
16.1	10.890	172	42.39	50.006	94	46.32	35.355	104	29.55	9.953	124	76.84
26.1	10.761	129	40.22	49.952	54	46.78	35.295	60	29.38	9.867	86	75.19
Dec. 6.1	10.681	80	37.71	49.940	12	47.33	35.282	13	28.75	9.823	44	73.29
		28			33			37			1	
16.0	10.653		34.92	49.973		47.96	35.319		28.33	9.822		71.16
26.0	10.679	26	31.95	50.050	77	48.66	35.405	86	27.91	9.868	46	68.88
36.0	10.759	80	28.88	50.169	119	49.40	35.537	132	27.50	9.957	89	66.52
Mean Place	9.726		23.86	47.104		55.37	32.013		34.28	7.901		60.84
Sec δ , Tan δ	1.281		+0.801	1.013		-0.161	1.123		-0.511	1.067		+0.373
$D\phi\alpha$, $D\omega\alpha$	+0.04		-0.01	+0.07		0.00	+0.07		+0.01	+0.05		0.00
$D\phi\delta$, $D\omega\delta$	+0.1		-1.0	+0.1		-1.0	+0.1		-1.0	+0.1		-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	6 Aquilæ. Mag. 4.5		λ Pavonis. Mag. 4.4		β Lyrae. Var. 3.4-4.1		50 Draconis. Mag. 5.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 42	° ' " - 4 49	h m 18 44	° ' " -62 16	h m 18 47	° ' " +33 15	h m 18 48	° ' " +75 19
n.	49.174	71.79	36.39	58.72	2.292	61.07	55.64	77.71
11.0	49.311 137	72.78 99	36.63 24	56.29 243	2.395 103	58.20 287	55.64 0	74.27 344
21.0	49.484 173	73.74 96	36.96 33	53.96 233	2.543 148	55.40 280	55.80 16	70.87 340
30.9	49.688 204	74.64 90	37.36 40	51.80 216	2.731 188	52.78 262	56.14 34	67.63 324
b. 9.9	49.917 229	75.40 76	37.81 45	49.82 198	2.956 225	50.42 203	56.62 48	64.69 294
	252	60	50	173	256	199	61	254
19.9	50.169	76.00	38.31	48.09	3.212	48.43	57.23	62.15
ur. 1.8	50.436 267	76.40 40	38.86 55	46.61 148	3.492 280	46.90 153	57.95 72	60.11 204
11.8	50.716 280	76.55 15	39.43 57	45.43 118	3.794 302	45.89 101	58.75 80	58.66 145
21.8	51.004 288	76.46 9	40.02 59	44.54 89	4.107 313	45.43 46	59.63 88	57.83 83
31.8	51.298 294	76.09 37	40.63 61	43.98 56	4.429 322	45.54 11	60.52 89	57.66 17
	295	62	60	25	322	67	88	50
pr. 10.7	51.593	75.47	41.23	43.73	4.751	46.21	61.40	58.16
20.7	51.885 292	74.64 83	41.82 59	43.81 8	5.069 318	47.42 121	62.25 85	59.29 113
30.7	52.170 285	73.62 102	42.40 58	44.20 39	5.374 305	49.11 169	63.04 79	61.00 171
ay 10.7	52.443 273	72.43 119	42.95 55	44.91 71	5.663 289	51.22 211	63.76 72	63.24 224
20.6	52.698 255	71.14 129	43.46 51	45.91 100	5.927 264	53.68 246	64.38 62	65.91 267
	234	135	46	128	235	272	49	304
30.6	52.932	69.79	43.92	47.19	6.162	56.40	64.87	68.95
me 9.6	53.138 206	68.42 137	44.32 40	48.73 154	6.361 199	59.31 291	65.22 35	72.24 329
19.5	53.312 174	67.08 134	44.65 33	50.47 174	6.519 158	62.32 301	65.44 2	75.69 345
29.5	53.451 139	65.80 128	44.91 26	52.37 190	6.634 115	65.34 302	65.51 7	79.23 354
ily 9.5	53.549 98	64.62 118	45.07 16	54.38 201	6.702 68	68.30 296	65.43 8	82.74 351
	56	107	9	206	20	284	22	342
19.5	53.605	63.55	45.16	56.43	6.722	71.14	65.21	86.16
29.4	53.618 13	62.60 95	45.15 1	58.47 204	6.693 29	73.78 264	64.83 38	89.39 323
ug. 8.4	53.588 30	61.80 80	45.06 9	60.42 195	6.617 76	76.18 240	64.34 49	92.36 297
18.4	53.519 69	61.15 65	44.89 17	62.20 178	6.498 119	78.28 210	63.63 63	95.02 266
28.4	53.414 105	60.64 51	44.64 25	63.74 154	6.340 158	80.04 176	62.98 73	97.30 228
	134	37	31	124	190	140	81	188
pt. 7.3	53.280	60.27	44.33	64.98	6.150	81.44	62.17	99.18
17.3	53.122 158	60.04 23	43.96 37	65.86 88	5.935 215	82.44 100	61.29 88	100.59 141
27.3	52.951 171	59.94 10	43.57 39	66.35 49	5.705 230	83.02 58	60.37 92	101.50 91
ct. 7.2	52.776 175	59.96 2	43.17 40	66.40 5	5.468 237	83.17 15	59.43 94	101.90 40
17.2	52.608 168	60.10 14	42.78 39	66.01 39	5.236 232	82.88 29	58.48 95	101.77 13
	155	28	36	83	216	73	92	68
27.2	52.453	60.38	42.42	65.18	5.020	82.15	57.56	101.09
iv. 6.2	52.323 130	60.78 40	42.11 31	63.92 126	4.826 194	80.99 116	56.70 86	99.88 121
16.1	52.224 99	61.30 52	41.85 26	62.31 161	4.666 160	79.42 157	55.91 79	98.16 172
26.1	52.165 59	61.95 65	41.68 17	60.38 193	4.546 183	77.47 195	55.23 68	95.96 220
xc. 6.1	52.148 17	62.71 76	41.59 9	58.20 218	4.470 76	75.19 228	54.68 55	93.32 264
	26	86	0	233	28	256	43	299
16.1	52.174	63.57	41.59	55.87	4.442	72.63	54.25	90.33
26.0	52.243 69	64.51 94	41.68 9	53.43 244	4.463 21	69.88 275	53.98 27	87.09 324
36.0	52.353 110	65.50 99	41.88 20	50.98 245	4.534 71	67.03 285	53.90 8	83.67 342
1 Place	49.414	71.87	37.352	59.19	3.133	60.19	61.662	75.42
2, Tan δ	1.004	-0.085	2.150	-1.903	1.196	+0.656	3.951	+3.822
, D _α	+0.06	0.00	+0.11	+0.02	+0.04	-0.01	-0.04	-0.05
, D _δ	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Draconis. Mag. 4.8		σ Sagittarii. Mag. 2.1		θ Serpentis pr. Mag. 4.5		ϵ Lyrae. Var. 4.0-4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 49	° ' " +59 16	h m 18 50	° ' " -26 23	h m 18 52	° ' " + 4 5	h m 18 52	° ' " +43 49
Jan. 1.0	57.275	78.03	10.630	59.36	8.255	45.78	49.180	76.53
11.0	57.340	74.58 ³⁴⁵	10.781 ¹⁵¹	58.98 ³⁸	8.377 ¹²²	44.30 ¹⁴⁸	49.265 ⁸⁵	73.36 ³¹⁷
21.0	57.484 ¹⁴⁴	71.19 ³³⁹	10.972 ¹⁹¹	58.62 ³⁶	8.534 ¹⁵⁷	42.86 ¹⁴⁴	49.408 ¹³⁸	70.24 ³¹²
30.9	57.702 ²¹⁸	67.97 ³²²	11.197 ²²⁵	58.26 ³⁶	8.722 ¹⁹⁸	41.51 ¹³⁵	49.592 ¹⁸⁹	67.30 ²⁹⁴
Feb. 9.9	57.990 ²⁸⁸	65.06 ²⁹¹	11.451 ²⁵⁴	57.90 ³⁶	8.938 ²¹⁶	40.34 ¹¹⁷	49.825 ²³³	64.65 ²⁶⁵
	347	249	273	38	239	96	273	27
19.9	58.337	62.57	11.729	57.52	9.177	39.38	50.098	62.38
Mar. 1.8	58.735 ³⁹⁸	60.59 ¹⁹⁸	12.027 ²⁹⁸	57.11 ⁴¹	9.435 ²⁵⁸	38.70 ⁶⁸	50.403 ³⁰⁵	60.59 ¹⁷⁹
11.8	59.171 ⁴³⁶	59.21 ¹³⁸	12.338 ³¹¹	56.66 ⁴⁵	9.706 ²⁷¹	38.34 ³⁶	50.733 ³³⁰	59.36 ¹²⁸
21.8	59.632 ⁴⁶¹	58.45 ⁷⁶	12.660 ³²²	56.17 ⁴⁹	9.989 ²⁸³	38.31 ³	51.082 ³⁴⁹	58.72 ⁶⁴
31.8	60.107 ⁴⁷⁵	58.35 ¹⁰	12.988 ³²⁸	55.65 ⁵²	10.278 ²⁸⁹	38.63 ³²	51.440 ³⁵⁸	58.72 ⁰
	477	58	331	55	292	66	360	60
Apr. 10.7	60.584	58.93	13.319	55.10	10.570	39.29	51.800	59.32
20.7	61.048 ⁴⁶⁴	60.13 ¹²⁰	13.649 ³³⁰	54.53 ⁵⁷	10.860 ²⁹⁰	40.25 ⁹⁶	52.154 ³⁵⁴	60.51 ¹¹⁹
30.7	61.487 ⁴³⁹	61.91 ¹⁷⁸	13.972 ³²³	53.99 ⁵⁴	11.144 ²⁸⁴	41.49 ¹²⁴	52.495 ³⁴¹	62.24 ¹⁷³
May 10.7	61.891 ⁴⁰⁴	64.20 ²²⁹	14.282 ³¹⁰	53.48 ⁵¹	11.417 ²⁷³	42.96 ¹⁴⁷	52.815 ³²⁰	64.45 ²²¹
20.6	62.249 ³⁵⁸	66.94 ²⁷⁴	14.576 ²⁹⁴	53.03 ⁴⁵	11.672 ²⁵⁵	44.60 ¹⁶⁴	53.105 ²⁹⁰	67.06 ²⁶¹
	303	308	271	37	235	176	255	291
30.6	62.552	70.02	14.847	52.66	11.907	46.36	53.360	69.97
June 9.6	62.792 ²⁴⁰	73.35 ³³³	15.088 ²⁴¹	52.39 ²⁷	12.114 ²⁰⁷	48.18 ¹⁸²	53.572 ²¹²	73.12 ³¹⁵
19.5	62.964 ¹⁷²	76.84 ³⁴⁹	15.294 ²⁰⁶	52.23 ¹⁶	12.289 ¹⁷⁵	50.01 ¹⁸³	53.739 ¹⁶⁷	76.40 ³²⁸
29.5	63.062 ⁹⁸	80.39 ³⁵⁵	15.461 ¹⁶⁷	52.17 ⁶	12.430 ¹⁴¹	51.80 ¹⁷⁹	53.853 ¹¹⁴	79.72 ³³²
July 9.5	63.086 ²⁴	83.90 ³⁵¹	15.583 ¹²²	52.22 ⁵	12.529 ⁹⁹	53.50 ¹⁷⁰	53.914 ⁶¹	83.01 ³²⁹
	52	340	76	15	58	157	6	216
19.5	63.034	87.30	15.659	52.37	12.587	55.07	53.920	86.17
29.4	62.909 ¹²⁵	90.52 ³²²	15.686 ²⁷	52.61 ²⁴	12.602 ¹⁵	56.51 ¹⁴⁴	53.870 ⁵⁰	89.15 ²⁹⁸
Aug. 8.4	62.713 ¹⁹⁶	93.47 ²⁹⁵	15.665 ²¹	52.90 ²⁹	12.602 ²⁸	57.77 ¹²⁶	53.788 ¹⁰²	91.87 ²⁷²
18.4	62.453 ²⁶⁰	96.09 ²⁶²	15.599 ⁶⁶	53.24 ³⁴	12.574 ⁶⁸	58.83 ¹⁰⁶	53.617 ¹⁵¹	94.28 ²⁴¹
28.4	62.137 ³¹⁶	98.33 ²²⁴	15.492 ¹⁰⁷	53.58 ³⁴	12.506 ¹⁰⁴	58.83 ⁸⁷	53.617 ¹⁹⁵	96.33 ²⁰⁵
	365	182	142	31	133	65	230	165
Sept. 7.3	61.772	100.15	15.350	53.89	12.269	60.35	53.192	97.98
17.3	61.372 ⁴⁰⁰	101.50 ¹³⁵	15.181 ¹⁶⁹	54.14 ²⁵	12.111 ¹⁵⁸	60.81 ⁴⁶	52.931 ²⁶¹	99.22 ¹²⁴
27.3	60.947 ⁴²⁵	102.35 ⁸⁵	14.994 ¹⁸⁷	54.33 ¹⁹	11.938 ¹⁷³	61.04 ²³	52.653 ²⁷⁸	99.96 ⁷⁴
Oct. 7.2	60.512 ⁴³⁵	102.69 ³⁴	14.802 ¹⁹²	54.42 ⁹	11.761 ¹⁷⁷	61.07 ³	52.367 ²⁸⁶	100.24 ²⁸
17.2	60.080 ⁴³²	102.48 ²¹	14.615 ¹⁸⁷	54.42 ⁰	11.587 ¹⁷⁴	60.88 ¹⁹	52.083 ²⁸⁴	100.02 ²²
	415	74	170	10	159	39	269	70
27.2	59.665	101.74	14.445	54.32	11.428	60.49	51.814	99.32
Nov. 6.2	59.281 ³⁸⁴	100.47 ¹²⁷	14.299 ¹⁴⁶	54.13 ¹⁹	11.289 ¹³⁹	59.88 ⁶¹	51.570 ²⁴⁴	98.12 ¹²⁰
16.1	58.942 ³³⁹	98.68 ¹⁷⁹	14.190 ¹⁰⁹	53.84 ²⁹	11.182 ¹⁰⁷	59.08 ⁸⁰	51.361 ²⁰⁹	96.46 ¹⁶⁶
26.1	58.659 ²⁸³	96.42 ²⁶⁷	14.122 ⁶⁸	53.52 ³²	11.111 ³¹	58.09 ⁹⁹	51.194 ¹⁶⁷	94.37 ²⁰⁹
Dec. 6.1	58.440 ²¹⁹	93.75 ²²⁶	14.101 ²¹	53.15 ³⁷	11.080 ¹¹	56.91 ¹¹⁸	51.075 ¹¹⁹	91.88 ²⁴⁹
	146	303	26	39	11	131	63	278
16.1	58.294	90.72	14.127	52.76	11.091	55.60	51.010	89.10
26.0	58.226 ⁶⁸	87.45 ³²⁷	14.202 ⁷⁵	52.38 ³⁸	11.144 ⁵³	54.18 ¹⁴²	51.001 ⁹	86.07 ³⁰³
36.0	58.240 ¹⁴	84.04 ³⁴¹	14.323 ¹²¹	52.00 ³⁸	11.237 ⁹³	52.70 ¹⁴⁸	51.050 ⁴⁹	82.93 ³¹⁴
Mean Place	59.618	76.11	10.834	59.38	8.564	45.31	50.414	74.85
Sec δ , Tan δ	1.958	+1.683	1.116	-0.496	1.003	+0.072	1.386	+0.960
$D\psi\alpha$, $D\omega\alpha$	+0.02	-0.02	+0.07	+0.01	+0.06	0.00	+0.04	-0.01
$D\psi\delta$, $D\omega\delta$	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	γ Lyrae. Mag. 3.3		ϵ Aquilæ. Mag. 4.2		ζ Sagittarii. Mag. 2.7		ζ Aquilæ. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 55	° ' " +32 34	h m 18 55	° ' " +14 57	h m 18 57	° ' " -29 59	h m 19 1	° ' " +13 44
a. 1.0	51.728	36.12	53.585	22.43	23.484	55.42	38.038	27.55
11.0	51.821	33.30	53.695	20.38	23.632	54.79	38.142	25.56
21.0	51.959	30.53	53.840	18.37	23.820	54.17	38.283	23.62
30.9	52.138	27.93	54.020	16.49	24.045	53.56	38.459	21.80
b. 9.9	52.354	25.57	54.231	14.82	24.301	52.96	38.664	20.19
19.9	52.601	23.57	54.465	13.42	24.581	52.36	38.894	18.83
ur. 1.8	52.874	22.01	54.720	12.38	24.883	51.76	39.146	17.82
11.8	53.169	20.96	54.992	11.73	25.201	51.16	39.414	17.19
21.8	53.479	20.45	55.275	11.50	25.530	50.55	39.695	16.98
31.8	53.797	20.52	55.566	11.72	25.867	49.94	39.985	17.19
ur. 10.7	54.119	21.13	55.861	12.36	26.209	49.36	40.279	17.83
20.7	54.438	22.27	56.154	13.41	26.549	48.79	40.573	18.87
30.7	54.746	23.91	56.440	14.83	26.884	48.27	40.861	20.26
uy 10.7	55.039	25.97	56.714	16.56	27.208	47.81	41.138	21.96
20.6	55.309	28.37	56.970	18.54	27.514	47.45	41.398	23.90
30.6	55.551	31.06	57.205	20.71	27.798	47.20	41.637	26.03
ne 9.6	55.758	33.94	57.410	23.00	28.052	47.06	41.848	28.28
19.5	55.926	36.93	57.583	25.33	28.271	47.05	42.026	30.57
29.5	56.051	39.94	57.718	27.66	28.450	47.17	42.168	32.85
ly 9.5	56.129	42.91	57.813	29.91	28.583	47.42	42.269	35.06
19.5	56.160	45.76	57.865	32.04	28.669	47.76	42.327	37.14
29.4	56.142	48.43	57.873	34.01	28.704	48.19	42.341	39.08
ug. 8.4	56.077	50.86	57.838	35.77	28.689	48.67	42.312	40.80
18.4	55.967	53.00	57.761	37.29	28.627	49.19	42.242	42.31
28.4	55.817	54.83	57.649	38.56	28.521	49.69	42.135	43.56
pt. 7.3	55.635	56.28	57.506	39.56	28.378	50.14	41.996	44.55
17.3	55.426	57.35	57.338	40.26	28.206	50.52	41.833	45.25
27.3	55.201	58.00	57.155	40.67	28.016	50.80	41.653	45.67
st. 7.2	54.969	58.23	56.965	40.77	27.817	50.95	41.467	45.80
17.2	54.739	58.03	56.779	40.56	27.622	50.97	41.282	45.62
27.2	54.523	57.39	56.606	40.06	27.441	50.84	41.110	45.16
rv. 6.2	54.329	56.32	56.454	39.24	27.287	50.59	40.958	44.39
16.1	54.166	54.84	56.332	38.13	27.167	50.21	40.836	43.34
26.1	54.041	52.98	56.245	36.77	27.090	49.73	40.746	42.04
xc. 6.1	53.959	50.78	56.198	35.15	27.059	49.18	40.697	40.50
16.1	53.924	48.30	56.194	33.34	27.078	48.59	40.690	38.76
26.0	53.938	45.61	56.233	31.38	27.147	47.97	40.725	36.88
36.0	53.999	42.80	56.314	29.33	27.262	47.34	40.801	34.91
a Place	52.541	34.57	54.023	21.49	23.701	55.32	38.455	26.35
b, Tan δ	1.187	+0.639	1.035	+0.267	1.155	-0.577	1.029	+0.245
, D _a α	+0.04	-0.01	+0.05	0.00	+0.08	+0.01	+0.05	0.00
, D _a δ	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Aquilæ. Mag. 3.6		α Coroneæ Australis. Mag. 4.1		ϵ Lyreæ. Mag. 5.1		π Sagittarii. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 1	° ' - 5 0	h m 19 3	° ' -38 1	h m 19 4	° ' +35 58	h m 19 4	° ' -21 9
	s	"	s	"	s	"	s	"
Jan. 1.0	53.601	22.45	53.359	61.29	21.654	17.48	53.092	18.04
11.0	53.719 118	23.37 92	53.510 151	60.14 115	21.734 80	14.58 290	53.221 129	17.94 10
21.0	53.874 155	24.27 90	53.706 196	59.01 113	21.861 127	11.70 288	53.389 168	17.84 10
30.9	54.060 186	25.09 82	53.941 235	57.91 110	22.031 170	8.97 273	53.591 202	17.71 12
Feb. 9.9	54.274 214	25.79 70	54.213 272	56.85 106	22.241 210	6.50 247	53.821 230	17.53 18
	237	54	301	101	245	212	257	24
19.9	54.511	26.33	54.514	55.84	22.486	4.38	54.078	17.29
Mar. 1.9	54.768 257	26.65 32	54.837 323	54.90 94	22.760 274	2.70 168	54.353 275	16.98 31
11.8	55.039 271	26.75 10	55.181 344	54.01 89	23.058 298	1.52 118	54.644 291	16.57 41
21.8	55.322 283	26.59 16	55.539 358	53.20 81	23.372 314	0.90 02	54.949 305	16.07 50
31.8	55.613 291	26.18 41	55.906 367	52.48 72	23.698 326	0.87 3	55.262 313	15.47 60
	295	67	373	64	331	53	318	67
Apr. 10.7	55.908	25.51	56.279	51.84	24.029	1.40	55.580	14.80
20.7	56.204 296	24.62 89	56.652 373	51.32 52	24.358 329	2.49 109	55.898 318	14.05 75
30.7	56.496 292	23.54 108	57.019 367	50.92 40	24.678 320	4.09 160	56.213 315	13.28 77
May 10.7	56.778 282	22.30 124	57.375 356	50.67 25	24.982 304	6.15 206	56.518 305	12.50 78
20.6	57.046 268	20.96 134	57.713 338	50.57 10	25.265 283	8.59 244	56.810 292	11.74 76
	247	140	313	6	252	273	271	70
30.6	57.293	19.56	58.026	50.63	25.517	11.32	57.081	11.04
June 9.6	57.514 221	18.14 142	58.309 283	50.87 24	25.735 218	14.27 296	57.324 243	10.40 64
19.6	57.705 191	16.75 139	58.552 243	51.26 39	25.912 177	17.36 309	57.535 211	9.87 53
29.5	57.860 155	15.42 133	58.751 199	51.82 56	26.045 133	20.49 313	57.708 173	9.45 42
July 9.5	57.975 115	14.19 123	58.901 150	52.52 70	26.130 85	23.58 309	57.840 132	9.14 31
	73	110	97	80	35	299	87	17
19.5	58.048	13.09	58.998	53.32	26.165	26.57	57.927	8.97
29.4	58.077 29	12.11 98	59.040 42	54.19 87	26.150 15	29.39 282	57.966 39	8.90 7
Aug. 8.4	58.063 14	11.28 83	59.027 13	55.10 91	26.085 65	31.98 259	57.960 6	8.92 2
18.4	58.008 55	10.62 66	58.961 66	56.02 92	25.974 111	34.28 230	57.908 52	9.02 10
28.4	57.916 92	10.09 53	58.848 113	56.87 85	25.821 153	36.25 197	57.816 92	9.17 15
	125	37	154	74	188	161	128	19
Sept. 7.3	57.791	9.72	58.694	57.61	25.633	37.86	57.688	9.36
17.3	57.641 150	9.48 24	58.505 189	58.22 61	25.417 216	39.06 120	57.531 157	9.55 19
27.3	57.474 167	9.38 10	58.295 210	58.66 44	25.182 235	39.84 78	57.357 174	9.72 17
Oct. 7.3	57.300 174	9.40 2	58.075 220	58.88 22	24.938 244	40.19 35	57.174 183	9.87 15
17.2	57.129 171	9.54 14	57.857 218	58.89 1	24.695 243	40.10 9	56.994 180	9.96 9
	158	27	202	22	231	55	167	5
27.2	56.971	9.81	57.655	58.67	24.464	39.55	56.827	10.01
Nov. 6.2	56.833 138	10.19 38	57.479 176	58.24 43	24.254 210	38.54 101	56.681 146	10.01 0
16.1	56.726 107	10.69 50	57.338 141	57.60 64	24.074 180	37.09 145	56.567 114	9.97 4
26.1	56.653 73	11.30 61	57.243 95	56.80 80	23.931 143	35.24 185	56.492 75	9.91 6
Dec. 6.1	56.620 33	12.03 73	57.200 43	55.86 94	23.831 100	33.01 223	56.459 33	9.83 5
	9	81	9	104	51	253	11	9
16.1	56.629	12.84	57.209	54.82	23.780	30.48	56.470	9.74
26.0	56.681 52	13.73 89	57.271 62	53.72 110	23.778 2	27.72 276	56.527 57	9.65 9
36.0	56.771 90	14.65 92	57.387 116	52.59 113	23.825 47	24.82 290	56.628 101	9.57 8
Mean Place	53.834	22.94	53.640	60.94	22.561	15.12	53.281	18.05
Sec δ , Tan δ	1.004	-0.088	1.270	-0.782	1.236	+0.726	1.072	-0.387
$D\psi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.08	+0.01	+0.04	-0.01	+0.07	+0.01
$D\psi\delta$, $D\omega\delta$	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ Sagittarii. Mag. 4.9		δ Draconis. Mag. 3.2		d Sagittarii. Mag. 5.0		θ Lyrae. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 10	° ' " -25 23	h m 19 12	° ' " +67 30	h m 19 12	° ' " -19 5	h m 19 13	° ' " +37 58
	s 19 10	" -25 23	s 19 12	" +67 30	s 19 12	" -19 5	s 19 13	" +37 58
Jan. 1.0	30.614	57.07	28.93	66.84	50.086	59.56	30.303	76.73
11.0	30.742 128	56.69 38	28.92 1	63.42 342	50.206 120	59.56 0	30.370 67	73.79 294
21.0	30.911 169	56.29 40	29.02 10	59.99 343	50.363 157	59.56 0	30.485 115	70.85 294
30.9	31.114 203	55.88 41	29.21 19	56.67 332	50.554 191	59.51 5	30.645 160	68.05 280
Feb. 9.9	31.346 232	55.45 43	29.51 30	53.60 307	50.775 221	59.41 10	30.848 203	65.49 256
	260	47	39	272	245	18	238	222
19.9	31.606	54.98	29.90	50.88	51.020	59.23	31.086	63.27
Mar. 1.9	31.886 280	54.46 52	30.38 48	48.64 224	51.286 266	58.94 29	31.358 272	61.49 178
11.8	32.185 299	53.88 58	30.91 53	46.95 169	51.569 283	58.55 39	31.656 298	60.21 128
21.8	32.496 311	53.26 62	31.48 57	45.87 108	51.866 297	58.04 51	31.973 317	59.49 72
31.8	32.817 321	52.58 68	32.09 61	45.46 41	52.173 307	57.42 62	32.304 331	59.36 13
	327	72	61	24	313	74	338	47
Apr. 10.7	33.144	51.86	32.70	45.70	52.486	56.68	32.642	59.83
20.7	33.474 330	51.12 74	33.31 61	46.61 91	52.801 315	55.87 81	32.980 338	60.84 101
30.7	33.800 326	50.39 73	33.89 58	48.11 150	53.113 312	55.01 86	33.310 330	62.40 156
May 10.7	34.117 317	49.71 68	34.43 54	50.17 208	53.416 303	54.12 89	33.626 316	64.43 203
20.6	34.419 302	49.07 64	34.92 49	52.71 254	53.707 291	53.23 89	33.919 293	66.85 242
	283	56	40	294	272	84	264	274
30.6	34.702	48.51	35.32	55.65	53.979	52.39	34.183	69.59
June 9.6	34.957 255	48.06 45	35.65 33	58.88 323	54.225 246	51.61 78	34.412 229	72.57 298
19.6	35.179 222	47.73 39	35.89 24	62.35 317	54.440 215	50.93 68	34.601 189	75.70 313
29.5	35.365 186	47.54 19	36.04 15	65.92 357	54.618 178	50.35 58	34.744 143	78.89 319
July 9.5	35.506 141	47.47 7	36.09 5	69.53 361	54.757 139	49.90 45	34.836 92	82.07 318
	94	5	7	354	93	33	43	308
19.5	35.600	47.52	36.02	73.07	54.850	49.57	34.879	85.15
29.4	35.648 48	47.68 16	35.88 14	76.48 341	54.897 47	49.38 19	34.869 10	88.08 293
Aug. 8.4	35.646 2	47.94 26	35.63 25	79.68 320	54.897 0	49.29 9	34.809 60	90.79 271
18.4	35.598 48	48.25 31	35.30 33	82.59 291	54.853 44	49.29 0	34.700 109	93.22 243
28.4	35.508 90	48.60 35	34.89 41	85.15 256	54.767 86	49.37 8	34.547 153	95.32 210
	130	35	48	217	122	13	188	173
Sept. 7.3	35.378	48.95	34.41	87.32	54.645	49.50	34.359	97.05
17.3	35.220 158	49.28 33	33.87 54	89.04 172	54.495 150	49.66 16	34.140 219	98.38 133
27.3	35.042 178	49.56 28	33.30 57	90.28 124	54.325 170	49.83 17	33.900 240	99.30 92
Oct. 7.3	34.854 188	49.75 19	32.71 59	91.00 72	54.146 179	49.99 16	33.650 250	99.75 45
17.2	34.668 186	49.86 11	32.11 60	91.19 19	53.967 179	50.12 13	33.399 251	99.76 1
	176	1	58	36	167	10	242	47
27.2	34.492	49.87	31.53	90.83	53.800	50.22	33.157	99.29
Nov. 6.2	34.340 152	49.79 8	30.98 55	89.91 92	53.653 147	50.30 8	32.936 221	98.35 94
16.1	34.218 122	49.63 16	30.47 51	88.45 146	53.536 117	50.35 5	32.743 193	96.96 139
26.1	34.136 82	49.38 25	30.02 45	86.48 197	53.456 80	50.38 3	32.586 157	95.15 181
Dec. 6.1	34.096 40	49.09 29	29.64 38	84.05 243	53.416 40	50.41 3	32.473 113	92.96 219
	6	32	28	283	5	2	67	251
16.1	34.102	48.77	29.36	81.22	53.421	50.43	32.406	90.45
26.0	34.156 54	48.41 36	29.17 19	78.07 315	53.468 47	50.45 2	32.389 17	87.69 276
36.0	34.254 98	48.05 36	29.09 8	74.72 335	53.559 91	50.48 3	32.422 33	84.78 291
Mean Place	30.809	56.92	32.436	62.17	50.269	59.63	31.268	73.51
Sec δ , Tan δ	1.107	-0.475	2.615	+2.416	1.058	-0.346	1.269	+0.781
$D\psi a$, $D_{\omega} a$	+0.07	+0.01	0.00	-0.05	+0.07	+0.01	+0.04	-0.02
$D\psi \delta$, $D_{\omega} \delta$	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0	+0.1	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ω Aquilæ. Mag. 5.1		κ Cygni. Mag. 4.0		τ Draconis. Mag. 4.6		δ Aquilæ. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 13	° ' " +11 26	h m 19 15	° ' " +53 12	h m 19 17	° ' " +73 11	h m 19 21	° ' " + 2 56
Jan. 1.0	57.677	49.52	10.772	64.34	3.39	78.53	21.570	62.69
11.0	57.770 ⁹³	47.71 ¹⁸¹	10.808 ³⁶	61.04 ³³⁰	3.32 ⁷	75.15 ³³⁸	21.663 ⁹³	61.36 ¹³³
21.0	57.901 ¹³¹	45.92 ¹⁷⁹	10.912 ¹⁰⁴	57.74 ³³⁰	3.39 ⁷	71.72 ³⁴³	21.794 ¹³¹	60.06 ¹³⁰
30.9	58.066 ¹⁶⁵	44.24 ¹⁶⁸	11.078 ¹⁶⁶	54.56 ³¹⁸	3.60 ²¹	68.39 ³³⁰	21.957 ¹⁶³	58.85 ¹²¹
Feb. 9.9	58.260 ¹⁹⁴	42.73 ¹⁵¹	11.304 ²²⁶	51.63 ²⁹³	3.96 ³⁶	65.29 ³¹⁰	22.148 ¹⁹¹	57.79 ¹⁰⁶
19.9	58.481 ²²¹	41.49 ¹²⁴	11.583 ²⁷⁹	49.06 ²⁵⁷	4.43 ⁴⁷	62.53 ²⁷⁶	22.366 ²¹⁸	56.93 ⁸⁶
Mar. 1.9	58.724 ²⁴³	40.54 ⁹⁵	11.908 ³²⁵	46.95 ²¹¹	5.01 ⁵⁸	60.22 ²³¹	22.605 ²³⁹	56.33 ⁶⁰
11.8	58.986 ²⁶²	39.97 ⁵⁷	12.272 ³⁶⁴	45.38 ¹⁵⁷	5.68 ⁶⁷	58.45 ¹⁷⁷	22.863 ²⁵⁸	56.03 ³⁰
21.8	59.261 ²⁷⁵	39.79 ¹⁸	12.665 ³⁹³	44.44 ⁹⁴	6.41 ⁷³	57.29 ¹¹⁶	23.135 ²⁷²	56.04 ¹
31.8	59.548 ²⁸⁷	40.01 ²²	13.075 ⁴¹⁰	44.12 ³²	7.19 ⁷⁸	56.78 ⁵¹	23.419 ²⁸⁴	56.40 ³⁴
Apr. 10.8	59.840 ²⁹²	40.64 ⁶³	13.494 ⁴¹⁹	44.44 ³²	7.98 ⁷⁹	56.92 ¹⁴	23.710 ²⁹¹	57.08 ⁶⁸
20.7	60.134 ²⁹⁴	41.65 ¹⁰¹	13.912 ⁴¹⁸	45.41 ⁹⁷	8.77 ⁷⁹	57.71 ⁷⁹	24.005 ²⁹⁵	58.05 ⁹⁷
30.7	60.426 ²⁹²	42.99 ¹³⁴	14.316 ⁴⁰⁴	46.95 ¹⁵⁴	9.50 ⁷³	59.13 ¹⁴²	24.298 ²⁹³	58.30 ¹²⁵
May 10.7	60.708 ²⁸²	44.64 ¹⁶⁵	14.698 ³⁸²	49.03 ²⁰⁸	10.20 ⁷⁰	61.09 ¹⁹⁶	24.584 ²⁸⁶	60.77 ¹⁴⁷
20.6	60.976 ²⁶⁸	46.52 ¹⁸⁸	15.047 ³⁴⁹	51.57 ²⁵⁴	10.81 ⁶¹	63.55 ²⁴⁶	24.858 ²⁷⁴	62.43 ¹⁶⁶
30.6	61.223 ²⁴⁷	48.58 ²⁰⁶	15.355 ³⁰⁸	54.48 ²⁹¹	11.33 ⁵²	66.40 ²⁸⁵	25.112 ²⁵⁴	64.19 ¹⁷⁶
June 9.6	61.444 ²²¹	50.74 ²¹⁶	15.615 ²⁶⁰	57.68 ³²⁰	11.74 ⁴¹	69.59 ³¹⁹	25.343 ²³¹	66.02 ¹⁸³
19.6	61.634 ¹⁹⁰	52.96 ²²²	15.819 ²⁰⁴	61.07 ³³⁹	12.03 ²⁰	73.00 ³⁴¹	25.544 ²⁰¹	67.87 ¹⁸⁵
29.5	61.788 ¹⁵⁴	55.16 ²²⁰	15.962 ¹⁴³	64.58 ³⁵¹	12.20 ¹⁷	76.56 ³⁵⁶	25.710 ¹⁶⁶	69.68 ¹⁸¹
July 9.5	61.902 ¹¹⁴	57.29 ²¹³	16.042 ⁸⁰	68.08 ³⁵⁰	12.23 ³	80.15 ³⁵⁹	25.837 ¹²⁷	71.40 ¹⁷³
19.5	61.974 ⁷²	59.31 ²⁰²	16.057 ¹⁵	71.53 ³⁴⁵	12.14 ⁹	83.70 ³⁵⁵	25.923 ⁸⁶	73.00 ¹⁶⁰
29.5	62.002 ²⁸	61.18 ¹⁸⁷	16.005 ⁵²	74.83 ³³⁰	11.91 ²³	87.13 ³⁴³	25.965 ⁴²	74.46 ¹⁴⁶
Aug. 8.4	61.986 ¹⁶	62.86 ¹⁶⁸	15.890 ¹¹⁵	77.90 ³⁰⁷	11.57 ³⁴	90.37 ³²⁴	25.964 ¹	75.75 ¹²⁹
18.4	61.928 ⁵⁸	64.31 ¹⁴⁵	15.716 ¹⁷⁴	80.69 ²⁷⁹	11.12 ⁴⁵	93.33 ²⁹⁶	25.920 ⁴⁴	76.84 ¹⁰⁹
28.4	61.833 ⁹⁵	65.53 ¹²²	15.487 ²²⁹	83.13 ²⁴⁴	10.56 ⁵⁶	95.96 ²⁶³	25.838 ⁸²	77.74 ⁹⁰
Sept. 7.3	61.705 ¹²⁸	66.51 ⁹⁸	15.212 ²⁷⁵	85.18 ²⁰⁶	9.90 ⁶⁶	98.21 ²²⁵	25.721 ¹¹⁷	78.42 ⁶⁸
17.3	61.549 ¹⁵⁶	67.21 ⁷⁰	14.901 ³¹¹	86.79 ¹⁶¹	9.19 ⁷¹	100.03 ¹⁸²	25.578 ¹⁴³	78.92 ⁵⁰
27.3	61.377 ¹⁷²	67.65 ⁴⁴	14.563 ³³⁸	87.93 ¹¹⁴	8.42 ⁷⁷	101.38 ¹³⁵	25.416 ¹⁶²	79.20 ²⁸
Oct. 7.3	61.195 ¹⁸²	67.81 ¹⁶	14.209 ³⁵⁴	88.57 ⁶⁴	7.61 ⁸¹	102.22 ⁸⁴	25.243 ¹⁷³	79.29 ⁹
17.2	61.014 ¹⁸¹	67.69 ¹²	13.853 ³⁵⁶	88.69 ¹²	6.80 ⁸¹	102.52 ³⁰	25.071 ¹⁷²	79.17 ¹²
27.2	60.844 ¹⁷⁰	67.30 ³⁹	13.508 ³⁴⁵	88.28 ⁴¹	6.00 ⁸⁰	102.28 ²⁴	24.907 ¹⁶⁴	78.86 ³¹
Nov. 6.2	60.691 ¹⁵³	66.64 ⁶⁶	13.183 ³²⁵	87.33 ⁹⁵	5.23 ⁷⁷	101.48 ⁸⁰	24.761 ¹⁴⁶	78.36 ⁵⁰
16.2	60.566 ¹²⁵	65.72 ⁹²	12.892 ²⁹¹	85.88 ¹⁴⁵	4.51 ⁷²	100.14 ¹³⁴	24.641 ¹²⁰	77.66 ⁷⁰
26.1	60.472 ⁹⁴	64.54 ¹¹⁸	12.645 ²⁴⁷	83.94 ¹⁹⁴	3.88 ⁶³	98.28 ¹⁸⁶	24.552 ⁸⁹	76.80 ⁸⁶
Dec. 6.1	60.417 ⁵⁵	63.15 ¹³⁹	12.449 ¹⁹⁶	81.55 ²³⁹	3.34 ⁵⁴	95.94 ²³⁴	24.500 ⁵²	75.78 ¹⁰²
16.1	60.401 ¹⁶	61.56 ¹⁵⁹	12.313 ¹³⁶	78.80 ²⁷⁵	2.91 ⁴³	93.19 ²⁷⁵	24.488 ¹²	74.61 ¹¹⁷
26.0	60.427 ²⁶	59.84 ¹⁷²	12.239 ⁷⁴	75.74 ³⁰⁶	2.61 ³⁰	90.11 ³⁰⁸	24.516 ²⁸	73.34 ¹²⁷
36.0	60.494 ⁶⁷	58.04 ¹⁸⁰	12.233 ⁶	72.50 ³²⁴	2.45 ¹⁶	86.80 ³³¹	24.584 ⁶⁸	72.02 ¹³²
Mean Place	58.052	47.86	12.518	60.09	8.400	73.10	21.844	61.26
Sec δ , Tan δ	1.020	+0.202	1.670	+1.338	3.461	+3.313	1.001	+0.052
$D\delta a$, $D_w a$	+0.06	0.00	+0.03	-0.03	-0.02	-0.07	+0.06	0.00
$D\delta \delta$, $D_w \delta$	+0.1	-0.9	+0.1	-0.9	+0.1	-0.9	+0.1	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	β Cygni. Mag. 3.2		γ Cygni. Mag. 3.9		μ Aquilæ. Mag. 4.6		η Sagittarii. Mag. 4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 27	° ' " +27 47	h m 19 27	° ' " +51 33	h m 19 30	° ' " + 7 12	h m 19 31	° ' " -25 3
	s 24.201	" 15.43	s 36.754	" 21.88	s 4.740	" 16.69	s 42.936	" 56.73
l. 1.0	24.201	15.43	36.754	21.88	4.740	16.69	42.936	56.73
11.0	24.266 65	12.89 254	36.776 22	18.66 322	4.822 82	15.15 154	43.041 105	56.32 41
21.0	24.372 106	10.36 253	36.861 85	15.40 326	4.941 119	13.63 152	43.184 143	55.87 45
31.0	24.518 146	7.93 243	37.008 147	12.25 315	5.094 153	12.20 143	43.364 180	55.39 48
b. 9.9	24.699 181	5.71 222	37.213 205	9.30 295	5.275 181	10.92 128	43.576 212	54.86 53
	215	194	256	260	209	105	239	50
19.9	24.914	3.77	37.469	6.70	5.484	9.87	43.815	54.27
r. 1.9	25.156 242	2.23 154	37.773 304	4.53 217	5.716 232	9.10 75	44.078 263	53.62 65
11.8	25.424 268	1.13 110	38.115 342	2.88 165	5.969 253	8.65 47	44.362 284	52.89 73
21.8	25.710 286	0.53 60	38.487 372	1.83 105	6.237 268	8.55 10	44.663 301	52.11 78
31.8	26.013 303	0.46 7	38.882 395	1.41 42	6.519 282	8.82 27	44.977 314	51.28 83
	310	45	406	21	290	63	323	89
r. 10.8	26.323	0.91	39.288	1.62	6.809	9.45	45.300	50.39
20.7	26.636 313	1.88 97	39.695 407	2.45 83	7.103 294	10.42 97	45.629 329	49.49 90
30.7	26.947 311	3.31 143	40.094 399	3.89 144	7.397 294	11.71 129	45.958 329	48.59 90
y 10.7	27.248 301	5.15 184	40.475 381	5.86 197	7.685 288	13.27 156	46.282 324	47.73 86
20.7	27.534 286	7.37 222	40.827 352	8.30 244	7.962 277	15.03 176	46.595 313	46.93 80
	262	250	316	283	258	192	295	70
30.6	27.796	9.87	41.143	11.13	8.220	16.95	46.890	46.23
ne 9.6	28.031 235	12.57 270	41.414 271	14.26 313	8.455 235	18.96 201	47.160 270	45.63 60
19.6	28.231 200	15.40 283	41.633 219	17.61 335	8.660 205	21.01 205	47.401 241	45.17 46
29.5	28.391 160	18.29 289	41.795 162	21.08 347	8.831 171	23.05 204	47.604 203	44.85 32
ly 9.5	28.507 116	21.16 287	41.896 101	24.59 351	8.963 132	25.01 196	47.766 162	44.70 15
	71	278	37	346	92	185	116	2
19.5	28.578	23.94	41.933	28.05	9.055	26.86	47.882	44.68
29.5	28.600 22	26.57 263	41.907 26	31.38 333	9.102 47	28.57 171	47.949 67	44.80 12
ug. 8.4	28.576 24	29.01 244	41.818 89	34.51 313	9.105 3	30.08 151	47.967 18	45.04 24
18.4	28.506 70	31.19 218	41.670 148	37.37 286	9.065 40	31.40 132	47.938 29	45.36 32
28.4	28.395 111	33.09 190	41.468 202	39.90 253	8.986 79	32.49 109	47.863 75	45.74 38
	147	157	249	216	114	87	114	41
pt. 7.4	28.248	34.66	41.219	42.06	8.872	33.36	47.749	46.15
17.3	28.071 177	35.88 122	40.933 286	43.79 173	8.731 141	33.99 63	47.603 146	46.55 40
27.3	27.874 197	36.73 85	40.618 315	45.07 128	8.569 162	34.39 40	47.433 170	46.91 36
st. 7.3	27.663 211	37.19 46	40.286 332	45.85 78	8.396 173	34.55 16	47.249 184	47.21 30
17.2	27.452 211	37.25 6	39.949 337	46.12 27	8.220 176	34.47 8	47.063 186	47.42 21
	205	34	331	25	168	32	178	13
27.2	27.247	36.91	39.618	45.87	8.052	34.15	46.885	47.55
rv. 6.2	27.058 189	36.16 75	39.306 312	45.09 78	7.901 151	33.61 54	46.726 159	47.57 2
16.2	26.895 163	35.01 115	39.023 283	43.79 130	7.774 127	32.84 77	46.594 132	47.49 8
26.1	26.764 131	33.50 151	38.779 244	42.00 179	7.676 98	31.87 97	46.496 98	47.34 15
sc. 6.1	26.670 94	31.66 184	38.583 196	39.76 224	7.615 61	30.69 118	46.439 57	47.09 25
	53	213	140	264	23	133	14	29
16.1	26.617	29.53	38.443	37.12	7.592	29.36	46.425	46.80
26.1	26.608 9	27.18 235	38.361 82	34.18 294	7.609 17	27.91 145	46.456 31	46.46 34
36.0	26.642 34	24.68 250	38.342 19	31.03 315	7.664 55	26.37 154	46.531 75	46.09 37
Place	24.845	11.85	38.349	16.52	5.045	14.63	43.112	56.41
h, Tan δ	1.130	+0.527	1.608	+1.260	1.008	+0.126	1.104	-0.468
D_{α}	+0.05	-0.01	+0.03	-0.03	+0.06	0.00	+0.07	+0.01
D_{δ}	+0.1	-0.9	+0.1	-0.9	+0.2	-0.3	+0.2	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Aquilæ. Mag. 5.0		θ Cygni. Mag. 4.6		δ Sagittarii. Mag. 5.4		β Sagittæ. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 32	° ' " - 7 12	h m 19 34	° ' " +50 1	h m 19 36	° ' " -16 28	h m 19 37	° ' " +17 16
Jan. 1.0	28.675	37.31	13.095	56.19	1.442	55.94	21.514	70.18
11.0	28.765	38.00	13.112	53.03	1.535	56.05	21.579	68.15
21.0	28.892	38.67	13.189	49.82	1.667	56.13	21.683	66.12
31.0	29.052	39.26	13.326	46.68	1.832	56.15	21.822	64.18
Feb. 9.9	29.240	39.74	13.518	43.76	2.027	56.09	21.995	62.41
19.9	29.455	40.07	13.761	41.16	2.249	55.93	22.197	60.90
Mar. 1.9	29.692	40.21	14.051	38.99	2.494	55.63	22.424	59.72
11.8	29.949	40.14	14.378	37.32	2.760	55.20	22.675	58.92
21.8	30.221	39.83	14.737	36.23	3.041	54.63	22.944	58.54
31.8	30.506	39.30	15.118	35.77	3.336	53.91	23.227	58.61
Apr. 10.8	30.800	38.53	15.513	35.93	3.642	53.06	23.521	59.13
20.7	31.099	37.56	15.911	36.71	3.953	52.10	23.821	60.07
30.7	31.398	36.41	16.302	38.10	4.265	51.05	24.120	61.42
May 10.7	31.693	35.13	16.679	40.01	4.572	49.96	24.414	63.12
20.7	31.978	33.76	17.029	42.40	4.870	48.86	24.696	65.10
30.6	32.246	32.34	17.345	45.18	5.151	47.78	24.958	67.33
June 9.6	32.491	30.92	17.620	48.28	5.410	46.76	25.197	69.71
19.6	32.708	29.53	17.845	51.60	5.641	45.83	25.405	72.18
29.5	32.892	28.22	18.016	55.04	5.836	45.01	25.577	74.68
July 9.5	33.038	27.03	18.128	58.53	5.992	44.34	25.710	77.14
19.5	33.141	25.96	18.179	61.99	6.105	43.80	25.800	79.51
29.5	33.200	25.04	18.166	65.33	6.173	43.41	25.844	81.73
Aug. 8.4	33.213	24.28	18.093	68.46	6.194	43.17	25.844	83.78
18.4	33.184	23.67	17.962	71.35	6.169	43.04	25.801	85.57
28.4	33.113	23.21	17.778	73.92	6.102	43.02	25.716	87.12
Sept. 7.4	33.007	22.90	17.546	76.12	5.997	43.10	25.595	88.39
17.3	32.872	22.73	17.277	77.90	5.861	43.24	25.446	89.38
27.3	32.717	22.68	16.978	79.24	5.702	43.41	25.275	90.05
Oct. 7.3	32.548	22.73	16.663	80.09	5.531	43.61	25.091	90.40
17.2	32.377	22.88	16.340	80.44	5.356	43.82	24.904	90.44
27.2	32.215	23.14	16.023	80.26	5.189	44.02	24.722	90.15
Nov. 6.2	32.068	23.48	15.723	79.57	5.037	44.21	24.556	89.55
16.2	31.946	23.89	15.449	78.36	4.912	44.39	24.412	88.64
26.1	31.854	24.39	15.212	76.65	4.817	44.56	24.298	87.42
Dec. 6.1	31.800	24.96	15.021	74.49	4.760	44.73	24.218	85.95
16.1	31.785	25.60	14.882	71.94	4.744	44.89	24.177	84.23
26.1	31.809	26.28	14.799	69.07	4.769	45.04	24.175	82.34
36.0	31.873	27.00	14.776	65.97	4.835	45.19	24.213	80.33
Mean Place	28.867	38.27	14.572	50.32	1.605	56.21	21.937	66.90
Sec δ , Tan δ	1.008	-0.126	1.557	+1.193	1.043	-0.296	1.048	+0.311
$D\psi\alpha$, $D_w\alpha$	+0.06	0.00	+0.03	-0.03	+0.07	+0.01	+0.05	-0.01
$D\psi\delta$, $D_w\delta$	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	15 Cygni. Mag. 5.0		f Sagittarii. Mag. 5.1		γ Aquilæ. Mag. 2.8		δ Cygni. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 41	° ' " +37 9	h m 19 41	° ' " -19 57	h m 19 42	° ' " +10 24	h m 19 42	° ' " +44 55
	s	"	s	"	s	"	s	"
Jan. 1.0	18.324	26.02	34.641	33.05	21.348	47.99	23.595	54.14
11.0	18.360	23.21	34.731	32.94	21.415	46.31	23.614	51.10
21.0	18.443	20.37	34.859	32.78	21.520	44.65	23.686	48.03
31.0	18.571	17.60	35.022	32.56	21.657	43.08	23.812	45.02
Feb. 9.9	18.743	15.02	35.215	32.28	21.826	41.66	23.987	42.20
19.9	18.953	12.74	35.437	31.91	22.023	40.47	24.208	39.68
Mar. 1.9	19.198	10.84	35.682	31.43	22.246	39.56	24.471	37.57
11.9	19.474	9.42	35.949	30.85	22.490	39.00	24.770	35.94
21.8	19.774	8.53	36.233	30.14	22.754	38.81	25.097	34.87
31.8	20.093	8.20	36.533	29.32	23.031	39.01	25.448	34.40
Apr. 10.8	20.426	8.45	36.842	28.41	23.320	39.61	25.811	34.54
20.7	20.764	9.26	37.158	27.43	23.615	40.57	26.181	35.28
30.7	21.100	10.60	37.477	26.39	23.912	41.88	26.549	36.60
May 10.7	21.428	12.44	37.792	25.34	24.205	43.48	26.904	38.44
20.7	21.738	14.70	38.097	24.32	24.487	45.32	27.240	40.75
30.6	22.026	17.32	38.387	23.34	24.752	47.36	27.547	43.45
June 9.6	22.281	20.20	38.654	22.45	24.995	49.51	27.817	46.45
19.6	22.499	23.27	38.894	21.67	25.208	51.71	28.045	49.66
29.6	22.673	26.45	39.098	21.04	25.388	53.92	28.224	53.01
July 9.5	22.802	29.65	39.262	20.54	25.530	56.07	28.352	56.40
19.5	22.879	32.80	39.383	20.20	25.629	58.11	28.420	59.77
29.5	22.904	35.81	39.457	20.01	25.684	60.02	28.432	63.02
Aug. 8.4	22.878	38.65	39.483	19.95	25.695	61.73	28.387	66.08
18.4	22.802	41.23	39.463	20.00	25.662	63.25	28.288	68.90
28.4	22.680	43.53	39.400	20.15	25.590	64.54	28.139	71.42
Sept. 7.4	22.517	45.48	39.297	20.39	25.481	65.57	27.945	73.58
17.3	22.322	47.05	39.162	20.66	25.343	66.35	27.716	75.34
27.3	22.100	48.21	39.002	20.94	25.183	66.88	27.458	76.67
Oct. 7.3	21.863	48.94	38.828	21.22	25.010	67.14	27.182	77.54
17.3	21.621	49.22	38.649	21.46	24.833	67.14	26.899	77.93
27.2	21.383	49.04	38.477	21.66	24.661	66.87	26.620	77.82
Nov. 6.2	21.158	48.40	38.321	21.82	24.504	66.35	26.356	77.20
16.2	20.958	47.30	38.190	21.92	24.368	65.57	26.115	76.08
26.1	20.789	45.77	38.090	21.98	24.262	64.55	25.907	74.49
Dec. 6.1	20.657	43.83	38.028	22.00	24.188	63.31	25.740	72.46
16.1	20.568	41.56	38.006	21.98	24.152	61.89	25.619	70.04
26.1	20.525	39.00	38.026	21.93	24.153	60.32	25.548	67.31
36.0	20.528	36.24	38.088	21.85	24.194	58.66	25.531	64.36
Mean Place	19.197	20.62	34.796	33.05	21.669	45.14	24.773	47.94
Sec δ, Tan δ	1.255	+0.758	1.064	-0.363	1.017	+0.184	1.413	+0.998
Dψ α, Dω α	+0.04	-0.02	+0.07	+0.01	+0.06	-0.01	+0.04	-0.03
Dψ δ, Dω δ	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Sagittæ. Mag. 3.8		α Aquilæ. (Altair.) Mag. 0.9		η Aquilæ. Var. 3.7-4.4		ϵ Draconis. Mag. 4.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 43	° ' " +18 19	h m 19 46	° ' " + 8 38	h m 19 48	° ' " + 0 47	h m 19 48	° ' " +70 3
Jan. 1.0	43.463	56.11	46.655	65.71	17.560	41.52	23.70	41.27
11.0	43.521 ⁵⁸	54.06 ²⁰⁵	46.724 ⁶⁹	64.15 ¹⁵⁶	17.630 ⁷⁰	40.40 ¹¹²	23.59 ¹¹	38.01 ³²⁶
21.0	43.617 ⁹⁶	52.00 ²⁰⁶	46.828 ¹⁰⁴	62.61 ¹⁵⁴	17.735 ¹⁰⁵	39.30 ¹¹⁰	23.58 ¹	34.63 ³³⁸
31.0	43.749 ¹³²	50.02 ¹⁹⁸	46.965 ¹³⁷	61.15 ¹⁴⁶	17.873 ¹³⁸	38.28 ¹⁰²	23.69 ¹¹	31.26 ³³⁷
Feb. 9.9	43.915 ¹⁶⁶	48.20 ¹⁸²	47.135 ¹⁷⁰	59.85 ¹³⁰	18.041 ¹⁶⁸	37.39 ¹⁸⁵	23.93 ²⁴	28.04 ³²²
	196	156	196	107	195	70	34	295
19.9	44.111	46.64	47.331	58.78	18.236	36.69	24.27	25.09
Mar. 1.9	44.334 ²²³	45.41 ¹²³	47.554 ²²³	57.98 ⁸⁰	18.457 ²²¹	36.22 ⁴⁷	24.71 ⁴⁴	22.53 ²⁵⁶
11.9	44.582 ²⁴⁸	44.56 ⁸⁵	47.797 ²⁴³	57.51 ⁴⁷	18.698 ²⁴¹	36.03 ¹⁹	25.24 ⁵³	20.46 ²⁰⁷
21.8	44.848 ²⁶⁶	44.14 ⁴²	48.061 ²⁶⁴	57.40 ¹¹	18.958 ²⁶⁰	36.13 ¹⁰	25.83 ⁵⁹	18.95 ¹⁵¹
31.8	45.131 ²⁸³	44.17 ³	48.338 ²⁷⁷	57.67 ²⁷	19.233 ²⁷⁵	36.53 ⁴⁰	26.48 ⁶⁵	18.08 ⁸⁷
	294	49	289	64	287	72	68	24
Apr. 10.8	45.425	44.66	48.627	58.31	19.520	37.25	27.16	17.84
20.7	45.726 ³⁰¹	45.58 ⁹²	48.922 ²⁹⁵	59.30 ⁹⁹	19.814 ²⁹⁴	38.24 ⁹⁹	27.84 ⁶⁸	18.27 ⁴³
30.7	46.028 ³⁰²	46.91 ¹³³	49.220 ²⁹⁸	60.63 ¹³³	20.110 ²⁹⁶	39.49 ¹²⁵	28.51 ⁶⁷	19.32 ¹⁰⁵
May 10.7	46.325 ²⁹⁷	48.61 ¹⁷⁰	49.514 ²⁹⁴	62.24 ¹⁶¹	20.404 ²⁹⁴	40.95 ¹⁴⁶	29.15 ⁶⁴	20.96 ¹⁶⁴
20.7	46.611 ²⁸⁶	50.62 ²⁰¹	49.797 ²⁸³	64.06 ¹⁸²	20.690 ²⁸⁶	42.59 ¹⁶⁴	29.74 ⁵⁹	23.14 ²¹⁸
	267	223	268	200	272	174	53	264
30.6	46.878	52.85	50.065	66.06	20.962	44.33	30.27	25.78
June 9.6	47.122 ²⁴⁴	55.26 ²⁴¹	50.310 ²⁴⁵	68.18 ²¹²	21.211 ²⁴⁹	46.13 ¹⁸⁰	30.71 ⁴⁴	28.79 ³⁰¹
19.6	47.335 ²¹³	57.77 ²⁵¹	50.526 ²¹⁶	70.33 ²¹⁵	21.434 ²²³	47.94 ¹⁸¹	31.06 ³⁵	32.10 ³³¹
29.6	47.513 ¹⁷⁸	60.32 ²⁵⁵	50.710 ¹⁸⁴	72.48 ²¹⁵	21.625 ¹⁹¹	49.70 ¹⁷⁶	31.30 ²⁴	35.62 ³⁵²
July 9.5	47.651 ⁹⁶	62.84 ²⁴³	50.854 ¹⁴⁴	74.56 ²⁰⁸	21.777 ¹⁵²	51.39 ¹⁶⁹	31.44 ¹⁴	39.24 ³⁶²
			103	197	112	155	3	365
19.5	47.747 ⁵⁰	65.27 ²²⁹	50.957 ⁵⁹	76.53 ¹⁸³	21.889 ⁶⁸	52.94 ¹⁴¹	31.47 ⁸	42.89 ³⁵⁰
29.5	47.797 ⁴	67.56 ²¹⁰	51.016 ¹⁵	78.36 ¹⁶⁴	21.957 ²⁴	54.35 ¹²³	31.39 ²⁶	46.48 ³⁴⁵
Aug. 8.4	47.801 ⁴⁰	69.66 ¹⁸⁹	51.031 ²⁸	80.00 ¹⁴⁴	21.981 ²⁰	55.58 ¹⁰⁵	31.19 ²⁹	49.93 ³²⁴
18.4	47.761 ⁸¹	71.55 ¹⁶³	51.003 ⁶⁹	81.44 ¹²¹	21.961 ⁶²	56.63 ⁸⁶	30.90 ³⁹	53.17 ²⁹⁶
28.4	47.680 ¹¹⁸	73.18 ¹³⁵	50.934 ¹⁰⁵	82.65 ⁹⁸	21.899 ⁹⁶	57.49 ⁶⁵	30.51 ⁴⁷	56.13 ²⁶¹
Sept. 7.4	47.562	74.53	50.829	83.63	21.803	58.14	30.04	58.74
17.3	47.416 ¹⁴⁶	75.58 ¹⁰⁵	50.695 ¹³⁴	84.36 ⁷³	21.675 ¹²⁸	58.61 ⁴⁷	29.50 ⁵⁴	60.96 ²²²
27.3	47.245 ¹⁷¹	76.31 ⁷³	50.539 ¹⁵⁶	84.85 ⁴⁹	21.525 ¹⁵⁰	58.88 ²⁷	28.90 ⁶⁰	62.73 ¹⁷⁷
Oct. 7.3	47.062 ¹⁸³	76.74 ⁴³	50.369 ¹⁷⁰	85.08 ²³	21.360 ¹⁶⁵	58.97 ⁹	28.26 ⁶⁴	64.01 ¹²⁸
17.3	46.874 ¹⁸⁸	76.82 ⁸	50.195 ¹⁷⁴	85.07 ¹	21.191 ¹⁶⁹	58.88 ⁹	27.60 ⁶⁶	64.77 ⁷⁶
	183	24	167	27	164	26	66	22
27.2	46.691	76.58	50.028	84.80	21.027	58.62	26.94	64.99
Nov. 6.2	46.522 ¹⁶⁹	76.00 ⁵⁸	49.873 ¹⁵⁵	84.30 ⁵⁰	20.875 ¹⁵²	58.19 ⁴³	26.29 ⁶⁵	64.64 ³⁵
16.2	46.375 ¹⁴⁷	75.11 ⁸⁹	49.739 ¹³⁴	83.56 ⁷⁴	20.745 ¹³⁰	57.61 ⁵⁸	25.68 ⁶¹	63.72 ⁹²
26.1	46.256 ¹¹⁹	73.90 ¹²⁹	49.635 ¹⁰⁴	82.61 ⁹⁵	20.643 ¹⁰²	56.87 ⁷⁴	25.11 ⁵⁷	62.25 ¹⁴⁷
Dec. 6.1	46.170 ⁸⁶	72.43 ¹⁴⁷	49.564 ⁷¹	81.44 ¹¹⁷	20.575 ⁶⁸	56.00 ⁸⁷	24.62 ⁴⁹	60.27 ¹⁹⁸
	48	172	35	132	32	98	40	246
16.1	46.122	70.71	49.529	80.12	20.543	55.02	24.22	57.81
26.1	46.113 ⁹	68.80 ¹⁹¹	49.532 ³	78.66 ¹⁴⁶	20.549 ⁶	53.95 ¹⁰⁷	23.91 ³¹	54.98 ²⁸³
36.0	46.144 ³¹	66.77 ²⁰³	49.574 ⁴²	77.12 ¹⁵⁴	20.592 ⁴³	52.82 ¹¹³	23.72 ¹⁹	51.83 ³¹⁵
Mean Place	43.890	52.40	46.951	62.97	17.776	39.46	27.562	32.56
Sec δ , Tan δ	1.054	+0.331	1.012	+0.152	1.000	+0.014	2.932	+2.757
$D\phi \alpha$, $D\omega \alpha$	+0.05	-0.01	+0.06	0.00	+0.06	0.00	0.00	-0.08
$D\phi \delta$, $D\omega \delta$	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Sagittarii. Mag. 4.2			ϵ Pavonis. Mag. 4.1			β Aquilæ. Mag. 3.9			γ Sagittæ. Mag. 3.7		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "
	19	49	-42 4	19	51	-73 7	19	51	+ 6 11	19	55	+19 15
Jan. 1.1	36.064		67.19	5.67		45.41	16.864		66.70	6.180		71.56
11.0	36.157	93	65.69	5.77	10	42.34	16.926	62	65.27	6.228	48	69.50
21.0	36.300	143	64.14	6.02	25	39.23	17.024	98	63.85	6.313	85	67.42
31.0	36.488	188	62.56	6.38	36	36.17	17.156	132	62.51	6.433	120	65.41
Feb. 9.9	36.717	229	60.98	6.87	49	33.20	17.319	163	61.32	6.587	154	63.56
		266			58			190			185	
19.9	36.983		59.42	7.45		30.40	17.509		60.33	6.772		61.95
Mar. 1.9	37.281	298	57.90	8.13	68	27.85	17.725	216	59.60	6.987	215	60.67
11.9	37.605	324	56.44	8.89	76	25.56	17.963	238	59.18	7.226	239	59.75
21.8	37.953	348	55.06	9.71	82	23.61	18.221	258	59.10	7.489	263	59.27
31.8	38.320	367	53.79	10.58	87	22.01	18.495	274	59.38	7.768	279	59.24
		382			90			286			293	
Apr. 10.8	38.702		52.66	11.48		20.80	18.781		60.01	8.061		59.67
20.7	39.092	390	51.66	12.39	91	19.98	19.075	294	60.97	8.364	303	60.56
30.7	39.486	394	50.83	13.80	91	19.60	19.372	297	62.24	8.668	304	61.85
May 10.7	39.876	390	50.21	14.20	90	19.64	19.667	295	63.77	8.969	301	63.53
20.7	40.256	380	49.80	15.06	86	20.10	19.953	296	65.51	9.261	292	65.52
		359			79			271			275	
30.6	40.615		49.62	15.85		20.98	20.224		67.41	9.536		67.76
June 9.6	40.949	334	49.67	16.58	73	22.26	20.473	249	69.40	9.788	252	70.19
19.6	41.248	299	49.94	17.23	65	23.89	20.695	222	71.43	10.011	223	72.73
29.6	41.504	256	50.48	17.76	53	25.82	20.886	191	73.45	10.200	189	75.32
July 9.5	41.712	208	51.21	18.17	41	28.02	21.037	151	75.40	10.348	148	77.90
		154			28			111			106	
19.5	41.866	96	52.12	18.45		30.40	21.148		77.25	10.454	61	80.40
29.5	41.962	36	53.18	18.60	15	32.90	21.215	22	78.95	10.515	11	82.77
Aug. 8.4	41.998	23	54.35	18.60	0	35.42	21.237		80.46	10.529	14	84.95
18.4	41.976	78	55.56	18.45	15	37.89	21.216	21	81.78	10.499	30	86.93
28.4	41.898	128	56.76	18.18	27	40.21	21.154	62	82.88	10.426	73	88.65
					39			98			110	
Sept. 7.4	41.770		57.90	17.79		42.29	21.056		83.77	10.316		90.09
17.3	41.600	170	58.93	17.29	50	44.04	20.927	129	84.42	10.176	140	91.23
27.3	41.396	204	59.79	16.70	59	45.39	20.775	152	84.85	10.010	166	92.06
Oct. 7.3	41.172	224	60.42	16.06	64	46.28	20.608	167	85.04	9.829	181	92.56
17.3	40.939	233	60.81	15.39	67	46.66	20.437	171	85.01	9.643	186	92.73
		228			68			167			185	
27.2	40.711		60.91	14.71		46.50	20.270		84.74	9.458		92.56
Nov. 6.2	40.501	210	60.74	14.07	64	45.80	20.115	155	84.27	9.286	172	92.05
16.2	40.318	183	60.30	13.50	57	44.58	19.981	134	83.58	9.134	152	91.22
26.1	40.174	144	59.58	13.01	49	42.86	19.874	107	82.69	9.008	126	90.06
Dec. 6.1	40.076	98	58.65	12.62	39	40.72	19.800	74	81.63	8.914	94	88.63
		49			26			38			58	
16.1	40.027		57.50	12.36		38.21	19.762		80.39	8.856		86.93
26.1	40.032	5	56.20	12.24	12	35.44	19.759	3	79.04	8.837	19	85.05
36.0	40.088	86	54.78	12.25	1	32.46	19.796	87	77.62	8.856	19	83.02
Mean Place	36.354		65.42	7.691		42.45	17.122		63.95	6.598		67.12
Sec δ , Tan δ	1.348		-0.903	3.445		-3.297	1.006		+0.109	1.059		+0.350
$D\phi\alpha$, $D_\alpha\alpha$	+0.08		+0.03	+0.14		+0.10	+0.06		0.00	+0.05		-0.01
$D\phi\delta$, $D_\alpha\delta$	+0.2		-0.9	+0.2		-0.9	+0.2		-0.9	+0.2		-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♄ Sagittarii. Mag. 4.6		♈ Aquilæ. Mag. 5.6		♈ Aquilæ. Mag. 3.4		♊ Cygni seq. Mag. 4.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 57	° ' " -27 56	h m 20 0	° ' " + 7 2	h m 20 7	° ' " - 1 3	h m 20 11	° ' " +46 29
Jan. 1.1	36.950	20.61	7.818	48.60	4.300	53.60	1.883	40.39
11.0	37.028 78	19.97 64	7.872 54	47.17 143	4.354 54	54.57 97	1.861 22	37.47 292
21.0	37.145 117	19.26 71	7.960 88	45.74 143	4.441 87	55.51 94	1.893 32	34.44 303
31.0	37.300 153	18.49 77	8.083 123	44.39 135	4.562 121	56.38 87	1.979 86	31.41 303
Feb. 10.0	37.489 189	17.66 83	8.237 154	43.18 121	4.714 152	57.11 73	2.119 140	28.50 291
	219	89	182	101	179	57	188	265
19.9	37.708	16.77	8.419	42.17	4.893	57.68	2.307	25.85
Mar. 1.9	37.955 247	15.83 94	8.628 209	41.43 74	5.099 206	58.01 33	2.543 236	23.55 220
11.9	38.226 271	14.83 100	8.860 232	40.98 45	5.328 229	58.11 10	2.820 277	21.69 186
21.8	38.517 291	13.78 105	9.114 254	40.89 9	5.579 251	57.91 20	3.134 314	20.36 133
31.8	38.827 310	12.69 109	9.384 270	41.16 27	5.846 267	57.44 47	3.478 344	19.60 76
	323	110	284	62	284	77	364	16
Apr. 10.8	39.150	11.59	9.668	41.78	6.130	56.67	3.842	19.44
20.8	39.484 334	10.49 110	9.961 293	42.74 96	6.423 293	55.64 108	4.220 378	19.91 47
30.7	39.821 337	9.42 107	10.258 297	44.02 128	6.722 299	54.36 128	4.601 381	20.95 104
May 10.7	40.158 337	8.42 100	10.555 297	45.58 156	7.022 300	52.90 146	4.978 377	22.54 159
20.7	40.487 316	7.51 91	10.844 299	47.35 177	7.315 293	51.27 163	5.340 362	24.63 209
		78	275	183	283	172	337	252
30.7	40.803	6.73	11.119	49.28	7.598	49.55	5.677	27.15
June 9.6	41.097 294	6.10 67	11.374 255	51.33 205	7.860 262	47.78 177	5.981 304	30.02 287
19.6	41.362 265	5.63 43	11.603 229	53.42 209	8.098 237	46.01 177	6.245 264	33.16 314
29.6	41.594 232	5.35 28	11.799 196	55.51 209	8.305 207	44.28 173	6.462 217	36.49 333
July 9.5	41.784 190	5.25 10	11.958 159	57.54 208	8.475 170	42.66 162	6.627 165	39.91 342
	144	7	118	192	130	150	108	344
19.5	41.928 95	5.32 25	12.076 75	59.46 178	8.605 86	41.16 136	6.735 49	43.35 338
29.5	42.023 45	5.57 38	12.151 30	61.24 159	8.691 42	39.80 117	6.784 9	46.73 324
Aug. 8.5	42.068 7	5.95 49	12.181 14	62.83 142	8.733 2	38.63 99	6.775 67	49.97 303
18.4	42.061 54	6.44 57	12.167 55	64.25 118	8.731 45	37.64 80	6.708 121	53.00 278
28.4	42.007 96	7.01 60	12.112 92	65.43 96	8.686 83	36.84 60	6.587 170	55.78 245
Sept. 7.4	41.911 134	7.61 60	12.020 124	66.39 71	8.603 115	36.24 43	6.417 211	58.23 208
17.4	41.777 163	8.21 56	11.896 147	67.10 49	8.488 140	35.81 23	6.206 244	60.31 167
27.3	41.614 180	8.77 49	11.749 165	67.59 25	8.348 157	35.58 8	5.962 268	61.98 122
Oct. 7.3	41.434 188	9.26 37	11.584 170	67.84 2	8.191 165	35.50 9	5.694 281	63.20 76
17.3	41.246 186	9.63 24	11.414 167	67.86 22	8.026 162	35.59 25	5.413 284	63.96 24
27.2	41.060 171	9.87 11	11.247 157	67.64 44	7.864 153	35.84 38	5.129 277	64.20 28
Nov. 6.2	40.889 149	9.98 3	11.090 138	67.20 67	7.711 135	36.22 53	4.852 258	63.92 78
16.2	40.740 117	9.95 17	10.952 111	66.53 86	7.576 108	36.75 66	4.594 232	63.14 128
26.2	40.623 80	9.78 30	10.841 80	65.67 105	7.468 79	37.41 76	4.362 190	61.86 175
Dec. 6.1	40.543 39	9.48 40	10.761 47	64.62 122	7.389 46	38.17 87	4.166 154	60.11 218
16.1	40.504 4	9.08 50	10.714 9	63.40 134	7.343 8	39.04 93	4.012 108	57.93 254
26.1	40.508 48	8.58 59	10.705 27	62.06 143	7.335 28	39.97 98	3.904 57	55.39 261
36.1	40.556	7.99	10.732	60.63	7.363	40.95	3.847	52.58
Mean Place	37.099	19.79	8.066	45.43	4.467	55.92	3.022	31.56
Sec δ, Tan δ	1.132	-0.530	1.008	+0.124	1.000	-0.019	1.453	+1.054
$D\psi\alpha, D_{\omega}\alpha$	+0.07	+0.02	+0.06	0.00	+0.06	0.00	+0.04	-0.04
$D\psi\delta, D_{\omega}\delta$	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9	+0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Cephei. Mag. 4.4		24 Vulpeculæ. Mag. 5.4		α^2 Capricorni. Mag. 3.8		β Capricorni. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 11	° ' +77 27	h m 20 13	° ' +24 24	h m 20 13	° ' -12 47	h m 20 16	° ' -15 2
Jan. 1.1	34.15	65.70	16.119	70.13	30.273	58.67	24.281	27.67
11.0	33.80	62.63	16.141	67.91	30.327	58.93	24.333	27.80
21.0	33.62	59.36	16.202	65.65	30.415	59.13	24.420	27.86
31.0	33.65	56.03	16.301	63.43	30.539	59.26	24.542	27.84
Feb. 10.0	33.86	52.76	16.435	61.35	30.693	59.29	24.696	27.72
19.9	34.26	49.69	16.605	59.50	30.876	59.18	24.878	27.46
Mar. 1.9	34.83	46.93	16.807	57.97	31.085	58.90	25.087	27.06
11.9	35.55	44.60	17.037	56.82	31.318	58.45	25.321	26.50
21.8	36.40	42.78	17.293	56.11	31.574	57.81	25.577	25.77
31.8	37.34	41.54	17.571	55.88	31.848	56.99	25.851	24.88
Apr. 10.8	38.34	40.92	17.866	56.13	32.137	56.01	26.142	23.84
20.8	39.38	40.96	18.174	56.87	32.439	54.86	26.446	22.67
30.7	40.41	41.62	18.487	58.08	32.748	53.59	26.757	21.40
May 10.7	41.40	42.90	18.799	59.71	33.058	52.24	27.070	20.07
20.7	42.32	44.72	19.103	61.70	33.363	50.85	27.379	18.71
30.7	43.15	47.06	19.393	63.99	33.658	49.46	27.677	17.38
June 9.6	43.87	49.81	19.660	66.52	33.936	48.11	27.959	16.10
19.6	44.44	52.92	19.901	69.20	34.189	46.83	28.216	14.92
29.6	44.85	56.28	20.105	71.98	34.410	45.69	28.444	13.86
July 9.5	45.11	59.83	20.270	74.78	34.597	44.66	28.635	12.95
19.5	45.19	63.46	20.391	77.53	34.741	43.81	28.784	12.22
29.5	45.11	67.10	20.465	80.16	34.841	43.12	28.888	11.65
Aug. 8.5	44.86	70.66	20.493	82.65	34.895	42.60	28.946	11.26
18.4	44.44	74.08	20.474	84.92	34.903	42.25	28.957	11.04
28.4	43.88	77.27	20.410	86.94	34.867	42.07	28.924	10.96
Sept. 7.4	43.18	80.17	20.307	88.67	34.790	42.01	28.849	11.01
17.4	42.37	82.73	20.171	90.10	34.679	42.06	28.740	11.17
27.3	41.45	84.88	20.007	91.19	34.541	42.21	28.603	11.41
Oct. 7.3	40.46	86.58	19.825	91.92	34.385	42.44	28.447	11.69
17.3	39.42	87.77	19.633	92.29	34.219	42.71	28.279	12.00
27.2	38.36	88.44	19.440	92.29	34.055	43.01	28.114	12.32
Nov. 6.2	37.29	88.55	19.256	91.91	33.900	43.33	27.956	12.64
16.2	36.26	88.08	19.089	91.15	33.763	43.67	27.816	12.95
26.2	35.29	87.04	18.945	90.04	33.651	44.01	27.703	13.24
Dec. 6.1	34.41	85.46	18.831	88.60	33.571	44.36	27.620	13.50
16.1	33.64	83.37	18.751	86.86	33.524	44.70	27.571	13.73
26.1	33.02	80.82	18.708	84.88	33.515	45.03	27.560	13.94
36.1	32.56	77.91	18.703	82.72	33.543	45.33	27.585	14.11
Mean Place	40.561	54.10	16.576	64.00	30.376	59.51	24.373	28.25
Sec δ , Tan δ	4.609	+4.499	1.098	+0.454	1.025	-0.227	1.035	-0.269
$D\psi\alpha$, $D_w\alpha$	-0.04	-0.16	+0.05	-0.02	+0.07	+0.01	+0.07	+0.01
$D\psi\delta$, $D_w\delta$	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Pavonis. Mag. 2.1		γ Cygni. Mag. 2.3		π Capricorni. Mag. 5.2		ρ Capricorni. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 19	° ' " -56 59	h m 20 19	° ' " +39 59	h m 20 22	° ' " -18 28	h m 20 24	° ' " -18 4
Jan. 1.1	9.505	60.32	16.262	45.60	37.672	52.51	11.041	68.08
11.0	9.551 ⁴⁶	58.02 ²³⁰	16.249 ¹³	42.88 ²⁷²	37.718 ⁴⁶	52.42 ⁹	11.086 ⁴⁵	68.01 ⁷
21.0	9.664 ¹¹³	55.59 ²⁴³	16.283 ³⁴	40.06 ²⁸²	37.802 ⁸⁴	52.25 ¹⁷	11.167 ⁸¹	67.87 ¹⁴
31.0	9.841 ¹⁷⁷	53.09 ²⁵⁰	16.363 ⁸⁰	37.23 ²⁷³	37.920 ¹¹⁸	51.99 ²⁶	11.283 ¹¹⁶	67.63 ²⁴
Feb. 10.0	10.079 ²³⁸	50.59 ²⁵⁰	16.490 ¹²⁷	34.53 ²⁸⁰	38.070 ¹⁵⁰	51.64 ³⁵	11.431 ¹⁴⁸	67.30 ³³
		293 ²⁴⁵	16.490 ¹⁷¹	34.53 ²⁴⁷	38.070 ¹⁸⁰	51.64 ⁴⁸	11.431 ¹⁷⁸	67.30 ⁴⁶
19.9	10.372	48.14	16.661	32.06	38.250	51.16	11.609	66.84
Mar. 1.9	10.715 ³⁴³	45.77 ²³⁷	16.874 ²¹³	29.92 ²¹⁴	38.458 ²⁰⁸	50.56 ⁶⁰	11.815 ²⁰⁶	66.25 ⁵⁹
11.9	11.101 ³⁸⁶	43.54 ²²³	17.125 ²⁵¹	28.20 ¹⁷²	38.691 ²³³	49.81 ⁷⁵	12.045 ²³⁰	65.51 ⁷⁴
21.9	11.526 ⁴²⁵	41.50 ²⁰⁴	17.408 ²⁸³	26.97 ¹²³	38.947 ²⁵⁶	48.93 ⁸⁸	12.300 ²⁵³	64.64 ⁸⁷
31.8	11.984 ⁴⁵⁸	39.66 ¹⁸⁴	17.719 ³¹¹	26.30 ⁶⁷	39.223 ²⁷⁶	47.92 ¹⁰¹	12.575 ²⁷⁵	63.63 ¹⁰¹
	484 ¹⁵⁸		333 ¹¹		294 ¹¹⁴		292 ¹¹⁴	
Apr. 10.8	12.468	38.08	18.052	26.19	39.517	46.78	12.867	62.49
20.8	12.970 ⁵⁰²	36.76 ¹³²	18.400 ³⁴⁸	26.68 ⁴⁹	39.825 ³⁰⁸	45.54 ¹²⁴	13.173 ³⁰⁶	61.26 ¹²³
30.7	13.482 ⁵¹²	35.76 ¹⁰⁰	18.753 ³⁵³	27.72 ¹⁰⁴	40.141 ³¹⁶	44.24 ¹³⁰	13.488 ³¹⁵	59.95 ¹³¹
May 10.7	13.995 ⁵¹³	35.09 ⁶⁷	19.103 ³⁶⁰	29.27 ¹⁵⁵	40.460 ³¹⁹	42.93 ¹³¹	13.806 ³¹⁸	58.62 ¹³³
20.7	14.500 ⁵⁰⁵	34.76 ³³	19.445 ³⁴²	31.30 ²⁰³	40.776 ³¹⁶	41.62 ¹³¹	14.122 ³¹⁶	57.29 ¹³³
	484 ²		322 ²⁴⁴		306 ¹²⁷		306 ¹²⁷	129
30.7	14.984	34.78	19.767	33.74	41.082	40.35	14.428	56.00
June 9.6	15.438 ⁴⁵⁴	35.15 ³⁷	20.061 ²⁹⁴	36.50 ²⁷⁶	41.372 ²⁹⁰	39.18 ¹¹⁷	14.718 ²⁹⁰	54.81 ¹¹⁹
19.6	15.850 ⁴¹²	35.87 ⁷²	20.322 ²⁶¹	39.52 ³⁰²	41.638 ²⁶⁶	38.12 ¹⁰⁶	14.984 ²⁶⁶	53.73 ¹⁰⁸
29.6	16.211 ³⁶¹	36.91 ¹⁰⁴	20.540 ²¹⁸	42.71 ³¹⁹	41.874 ²³⁶	37.21 ⁹¹	15.221 ²³⁷	52.79 ⁹⁴
July 9.6	16.511 ³⁰⁰	38.24 ¹³³	20.713 ¹⁷³	45.99 ³²⁸	42.073 ¹⁹⁹	36.47 ⁷⁴	15.420 ¹⁹⁹	52.03 ⁷⁶
	231 ¹⁵⁹		121 ¹⁵⁹	329 ¹⁵⁸		56 ¹⁵⁹		60
19.5	16.742	39.83	20.834	49.28	42.231	35.91	15.579	51.43
29.5	16.898 ¹⁵⁶	41.59 ¹⁷⁶	20.902 ⁶⁸	52.50 ³²²	42.344 ¹¹³	35.53 ³⁸	15.693 ¹¹⁴	51.03 ⁴⁰
Aug. 8.5	16.974 ⁷⁸	43.49 ¹⁹⁰	20.916 ¹⁴	55.58 ³⁰⁸	42.409 ⁶⁵	35.34 ¹⁹	15.760 ⁶⁷	50.82 ²¹
18.4	16.972 ²	45.45 ¹⁹⁶	20.878 ³⁸	58.48 ²⁹⁰	42.427 ¹⁸	35.31 ³	15.779 ¹⁹	50.76 ⁶
28.4	16.893 ⁷⁹	47.39 ¹⁹⁴	20.789 ⁸⁹	61.11 ²⁶³	42.399 ²⁸	35.41 ¹⁰	15.752 ²⁷	50.84 ⁸
	151 ¹⁸⁵		135 ¹⁸⁵	233 ¹⁸⁵	71 ¹⁸⁵	23 ¹⁸⁵	69 ¹⁸⁵	22
Sept. 7.4	16.742	49.24	20.654	63.44	42.328	35.64	15.683	51.06
17.4	16.528 ²¹⁴	50.90 ¹⁶⁶	20.480 ¹⁷⁴	65.42 ¹⁹⁸	42.221 ¹⁰⁷	35.96 ³²	15.577 ¹⁰⁶	51.35 ²⁹
27.3	16.262 ²⁶⁶	52.33 ¹⁴³	20.274 ²⁰⁶	67.00 ¹⁵⁸	42.086 ¹³⁵	36.32 ³⁶	15.442 ¹³⁵	51.71 ³⁶
Oct. 7.3	15.958 ³⁰⁴	53.44 ¹¹¹	20.046 ²²⁸	68.16 ¹¹⁶	41.929 ¹⁵⁷	36.70 ³⁸	15.287 ¹⁵⁵	52.09 ³⁸
17.3	15.633 ³²⁵	54.17 ⁷³	19.805 ²⁴¹	68.88 ⁷²	41.760 ¹⁰⁹	37.09 ³⁹	15.119 ¹⁰⁸	52.48 ³⁹
	331 ³³		214 ³³	25 ³³	169 ³⁶		108 ³⁶	
27.3	15.302	54.50	19.561	69.13	41.591	37.45	14.951	52.84
Nov. 6.2	14.981 ³²¹	54.40 ¹⁰	19.322 ²³⁹	68.90 ²³	41.431 ¹⁶⁰	37.77 ³²	14.791 ¹⁶⁰	53.17 ³³
16.2	14.689 ²⁹²	53.87 ⁵³	19.100 ²²²	68.19 ⁷¹	41.287 ¹⁴⁴	38.04 ²⁷	14.646 ¹⁴⁵	53.45 ²⁸
26.2	14.438 ²⁵¹	52.93 ⁹⁴	18.902 ¹⁹⁸	67.01 ¹¹⁸	41.169 ¹¹⁸	38.24 ²⁰	14.527 ¹¹⁹	53.66 ²¹
Dec. 6.1	14.238 ²⁰⁰	51.60 ¹³³	18.734 ¹⁶⁸	65.39 ¹⁶²	41.080 ¹⁶²	38.39 ¹⁵	14.437 ⁹⁰	53.83 ¹⁷
	138 ¹⁶⁷		130 ¹⁶⁷	202 ¹⁶⁷	54 ¹⁶⁷	9 ¹⁶⁷	55 ¹⁶⁷	11
16.1	14.100	49.93	18.604	63.37	41.026	38.48	14.382	53.94
26.1	14.027 ⁷³	47.97 ¹⁹⁶	18.515 ⁸⁹	61.02 ²³⁵	41.009 ¹⁷	38.51 ³	14.364 ¹⁸	53.99 ⁵
36.1	14.025 ²	45.78 ²¹⁹	18.471 ⁴⁴	58.40 ²⁶²	41.029 ²⁰	38.48 ³	14.383 ¹⁹	53.98 ¹
Mean Place	10.101	56.52	17.100	36.92	37.750	52.61	11.114	68.24
Sec δ , Tan δ	1.836	-1.540	1.305	+0.839	1.054	-0.334	1.052	-0.326
$D\psi \alpha$, $D\omega \alpha$	+0.09	+0.06	+0.04	-0.03	+0.07	+0.01	+0.07	+0.01
$D\psi \delta$, $D\omega \delta$	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	41 Cygni. Mag. 4.1			θ Cephei. Mag. 4.3			ϵ Delphini. Mag. 4.0			Groombridge 3241. Mag. 6.4		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	20 26		+30 5	20 28		+62 42	20 29		+11 1	20 30		+72 15
Jan. 1.1	2.220		47.16	10.28		77.43	17.531		30.38	18.29		27.37
11.0	2.220	0	44.79	10.14	14	74.41	17.554	23	28.84	18.02	27	24.38
21.0	2.262	42	42.33	10.09	5	71.19	17.611	57	27.27	17.88	14	21.17
31.0	2.342	80	39.90	10.12	3	67.90	17.702	91	25.76	17.87	1	17.86
Feb. 10.0	2.463	121	37.57	10.24	12	64.67	17.826	124	24.38	18.00	13	14.56
		159			20			154			25	
19.9	2.622		35.47	10.44		61.62	17.980		23.19	18.25		11.42
Mar. 1.9	2.814	192	33.68	10.73	29	58.89	18.163	183	22.26	18.62	37	8.56
11.9	3.041	227	32.27	11.08	35	56.56	18.375	212	21.65	19.12	50	6.10
21.9	3.298	257	31.31	11.49	41	54.74	18.610	235	21.39	19.70	58	4.13
31.8	3.578	280	30.86	11.96	47	53.50	18.868	258	21.51	20.36	66	2.73
		302			50			276			72	
Apr. 10.8	3.880		30.92	12.46		52.88	19.144		22.00	21.08		1.93
20.8	4.196	316	31.50	12.98	52	52.91	19.434	290	22.89	21.83	75	1.78
30.7	4.520	324	32.59	13.51	53	53.56	19.734	300	24.12	22.59	76	2.27
May 10.7	4.845	325	34.14	14.04	53	54.83	20.036	302	25.68	23.34	75	3.39
20.7	5.163	318	36.11	14.55	51	56.66	20.336	300	27.49	24.06	72	5.08
		304			47			290			65	
30.7	5.467		38.42	15.02		59.00	20.626		29.52	24.71		7.29
June 9.6	5.750	283	41.02	15.44	42	61.77	20.898	272	31.70	25.28	57	9.95
19.6	6.003	253	43.82	15.80	36	64.89	21.147	249	33.96	25.77	49	13.00
29.6	6.221	218	46.76	16.09	29	68.27	21.365	218	36.25	26.16	39	16.33
July 9.6	6.399	178	49.76	16.30	21	71.85	21.549	184	38.51	26.44	28	19.87
		132			14			143			14	
19.5	6.531	85	52.74	16.44	5	75.51	21.692	99	40.69	26.58		23.53
29.5	6.616	35	55.64	16.49	3	79.18	21.791	55	42.73	26.62	4	27.23
Aug. 8.5	6.651		58.40	16.46	3	82.78	21.846		44.62	26.53		30.89
18.4	6.638	13	60.96	16.35	11	86.22	21.856	10	46.30	26.32	21	34.41
28.4	6.578	60	63.27	16.15	20	89.46	21.823	33	47.76	25.99	33	37.74
		102			26			73			42	
Sept. 7.4	6.476		65.29	15.89		92.39	21.750		48.98	25.57		40.81
17.4	6.339	137	66.99	15.57	32	94.98	21.643	107	49.95	25.06	51	43.54
27.3	6.172	167	68.35	15.19	38	97.16	21.510	133	50.66	24.46	60	45.90
Oct. 7.3	5.983	189	69.32	14.78	41	98.89	21.356	154	51.11	23.81	65	47.80
17.3	5.782	201	69.89	14.34	44	100.13	21.190	166	51.29	23.12	69	49.19
		205			46			167			74	
27.3	5.577		70.06	13.88		100.83	21.023		51.21	22.38		50.07
Nov. 6.2	5.378	199	69.81	13.43	45	100.98	20.863	160	50.86	21.67	71	50.39
16.2	5.193	185	69.15	12.98	45	100.56	20.716	147	50.27	20.96	71	50.13
26.2	5.031	162	68.08	12.57	41	99.57	20.590	126	49.43	20.28	68	49.30
Dec. 6.1	4.895	136	66.64	12.20	37	98.04	20.490	100	48.38	19.66	62	47.89
		102			32			69			54	
16.1	4.793		64.86	11.88		96.00	20.421		47.12	19.12		45.96
26.1	4.728	65	62.79	11.62	26	93.51	20.385	36	45.72	18.67	45	43.55
36.1	4.701	27	60.50	11.45	17	90.66	20.382	3	44.20	18.33	34	40.75
Mean Place	2.750		39.41	12.527		65.30	17.743		25.53	22.282		14.21
Sec δ , Tan δ	1.156		+0.580	2.182		+1.939	1.019		+0.195	3.281		+3.125
$D\psi\alpha$, $D\omega\alpha$	+0.05		-0.02	+0.02		-0.08	+0.06		-0.01	0.00		-0.13
$D\psi\delta$, $D\omega\delta$	+0.2		-0.8	+0.2		-0.8	+0.2		-0.8	+0.2		-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Indi. Mag. 3.2			β Delphini. Mag. 3.7			ν Capricorni. Mag. 5.3			α Delphini. Mag. 3.9		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 20 31	s —47 34	" —47 34	h m 20 33	s +14 18	" +14 18	h m 20 35	s —18 25	" —18 25	h m 20 35	s +15 37	" +15 37
Jan. 1.1	47.893	46.42	42.030	38.45	22.975	40.81	49.530	26.14	174			
11.1	47.926 33	44.63 179	42.046 16	36.76 169	23.010 35	40.71 10	49.543 13	24.40	174			
21.0	48.011 85	42.69 194	42.096 50	35.04 172	23.080 70	40.53 18	49.589 46	22.62	178			
31.0	48.147 136	40.65 204	42.181 85	33.37 167	23.184 104	40.24 39	49.671 82	20.88	174			
Feb. 10.0	48.331 184	38.56 209	42.299 118	31.81 156	23.319 135	39.85 29	49.786 115	19.27	161			
	228	211	150	136	167	52	146		163			
19.9	48.559	36.45	42.449	30.45	23.486	39.33	49.932	17.84	116			
Mar. 1.9	48.828 269	34.36 209	42.628 179	29.36 109	23.681 195	38.67 66	50.111 179	16.68	82			
11.9	49.133 305	32.32 204	42.837 209	28.59 77	23.904 223	37.87 80	50.318 207	15.86	46			
21.9	49.472 339	30.37 195	43.070 233	28.20 39	24.151 247	36.93 94	50.550 232	15.40	46			
31.8	49.839 367	28.55 182	43.328 258	28.19 1	24.419 268	35.85 108	50.809 259	15.36	4			
	392	166	277	41	288	121	276		38			
Apr. 10.8	50.231	26.89	43.605	28.60	24.707	34.64	51.085	15.74				
20.8	50.640 409	25.41 148	43.896 291	29.43 83	25.011 304	33.34 130	51.377 292	16.53	79			
30.8	51.063 423	24.16 125	44.198 302	30.63 120	25.326 315	31.97 137	51.680 303	17.71	113			
May 10.7	51.490 427	23.16 100	44.504 306	32.17 154	25.646 320	30.57 140	51.987 307	19.26	155			
20.7	51.914 424	22.44 72	44.806 302	34.00 183	25.965 319	29.18 139	52.289 302	21.10	184			
	411	43	293	209	311	133	295		210			
30.7	52.325	22.01 12	45.099 275	36.09 225	26.276 296	27.85 125	52.584 277	23.20	228			
June 9.6	52.715 390	21.89 12	45.374 275	38.34 225	26.572 296	26.60 125	52.861 277	25.48	228			
19.6	53.074 359	22.08 19	45.626 252	40.71 237	26.847 275	25.48 112	53.115 254	27.89	241			
29.6	53.393 319	22.58 50	45.847 221	43.13 242	27.091 244	24.51 97	53.338 223	30.35	246			
July 9.6	53.664 271	23.37 79	46.034 187	45.54 241	27.301 210	23.73 78	53.526 188	32.82	247			
	216	104	146	234	169	61	147		240			
19.5	53.880 155	24.41 126	46.180 102	47.88 223	27.470 124	23.12 42	53.673 104	35.22	230			
29.5	54.035 89	25.67 113	46.282 57	50.11 205	27.594 78	22.70 21	53.777 58	37.52	212			
Aug. 8.5	54.124 26	27.10 154	46.339 13	52.16 187	27.672 29	22.49 5	53.835 12	39.64	185			
18.5	54.150 40	28.64 153	46.352 32	54.03 163	27.701 17	22.44 10	53.847 31	41.59	171			
28.4	54.110 99	30.22 156	46.320 71	55.66 140	27.684 59	22.54 25	53.816 71	43.30	146			
Sept. 7.4	54.011 153	31.78 148	46.249 107	57.06 112	27.625 97	22.79 33	53.745 106	44.76	119			
17.4	53.858 196	33.26 132	46.142 134	58.18 85	27.528 129	23.12 39	53.639 134	45.95	91			
27.3	53.662 228	34.58 109	46.008 154	59.03 56	27.399 150	23.51 43	53.505 155	46.86	61			
Oct. 7.3	53.434 248	35.67 80	45.854 167	59.59 27	27.249 165	23.94 43	53.350 168	47.47	31			
17.3	53.186 256	36.47 50	45.687 170	59.86 2	27.084 167	24.37 41	53.182 171	47.78	1			
27.3	52.930 248	36.97 14	45.517 164	59.84 31	26.917 160	24.78 37	53.011 166	47.79	29			
Nov. 6.2	52.682 229	37.11 21	45.353 151	59.53 59	26.757 147	25.15 31	52.845 153	47.50	58			
16.2	52.453 197	36.90 55	45.202 132	58.94 86	26.610 123	25.46 24	52.692 135	46.92	16			
26.2	52.256 157	36.35 88	45.070 105	58.08 111	26.487 97	25.70 18	52.557 108	46.06	114			
Dec. 6.2	52.099 110	35.47 119	44.965 76	56.97 133	26.390 63	25.88 12	52.449 79	44.92	156			
16.1	51.989 59	34.28 145	44.889 44	55.64 152	26.327 27	26.00 4	52.370 47	43.57	153			
26.1	51.930 4	32.83 167	44.845 9	54.12 166	26.300 7	26.04 3	52.323 12	42.02	171			
36.1	51.926	31.16	44.836	52.46	26.307	26.01	52.311	40.31				
Mean Place	48.189	42.86	42.267	32.86	23.023	40.89	49.775	20.23				
Sec δ , Tan δ	1.482	-1.094	1.032	+0.255	1.054	-0.333	1.038	+0.280				
$D\psi\alpha$, $D\omega\alpha$	+0.08	+0.04	+0.06	-0.01	+0.07	+0.01	+0.06	-0.01				
$D\psi\delta$, $D\omega\delta$	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8	+0.3	-0.8				

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Pavonis. Mag. 3.6		α Cygni. (Deneb.) Mag. 1.3		δ Delphini. Mag. 4.5		ψ Capricorni. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 37	s -66 29	h m 20 38	s +44 59	h m 20 39	s +14 46	h m 20 41	s -25 33
Jan. 1.1	34.05	62.34	37.232	23.05	37.625	52.32	14.564	59.40
11.1	34.04	59.62	37.182	20.33	37.635	50.63	14.593	58.89
21.0	34.11	56.73	37.183	17.45	37.678	48.91	14.659	58.26
31.0	34.28	53.74	37.234	14.51	37.757	47.24	14.762	57.51
Feb. 10.0	34.53	50.74	37.336	11.65	37.869	45.67	14.898	56.66
19.9	34.86	47.79	37.487	8.97	38.012	44.28	15.067	55.71
Mar. 1.9	35.26	44.94	37.687	6.60	38.186	43.17	15.266	54.65
11.9	35.74	42.26	37.931	4.63	38.390	42.38	15.493	53.48
21.9	36.27	39.81	38.214	3.13	38.620	41.94	15.747	52.23
31.8	36.85	37.63	38.533	2.19	38.874	41.91	16.024	50.90
Apr. 10.8	37.46	35.74	38.879	1.81	39.147	42.30	16.323	49.52
20.8	38.11	34.20	39.243	2.03	39.437	43.09	16.638	48.10
30.8	38.78	33.04	39.619	2.83	39.738	44.27	16.964	46.70
May 10.7	39.45	32.27	39.997	4.19	40.044	45.79	17.297	45.33
20.7	40.11	31.92	40.367	6.05	40.347	47.62	17.631	44.05
30.7	40.76	31.99	40.718	8.37	40.642	49.70	17.958	42.88
June 9.6	41.36	32.47	41.045	11.07	40.921	51.95	18.270	41.86
19.6	41.92	33.37	41.335	14.07	41.176	54.33	18.561	41.01
29.6	42.41	34.65	41.583	17.29	41.402	56.77	18.821	40.36
July 9.6	42.81	36.27	41.783	20.65	41.594	59.20	19.045	39.93
19.5	43.14	38.17	41.929	24.06	41.745	61.57	19.228	39.72
29.5	43.37	40.30	42.018	27.45	41.853	63.83	19.364	39.72
Aug. 8.5	43.49	42.59	42.051	30.75	41.915	65.93	19.452	39.92
18.5	43.50	44.94	42.026	33.88	41.933	67.84	19.489	40.28
28.4	43.41	47.29	41.946	36.79	41.906	69.51	19.477	40.78
Sept. 7.4	43.22	49.54	41.817	39.40	41.839	70.94	19.419	41.39
17.4	42.94	51.57	41.643	41.68	41.737	72.10	19.322	42.05
27.3	42.59	53.33	41.432	43.59	41.606	72.99	19.190	42.73
Oct. 7.3	42.18	54.74	41.196	45.07	41.454	73.59	19.033	43.39
17.3	41.71	55.72	40.939	46.09	41.288	73.89	18.861	43.99
27.3	41.24	56.22	40.675	46.63	41.119	73.91	18.684	44.49
Nov. 6.2	40.77	56.21	40.414	46.67	40.955	73.63	18.512	44.87
16.2	40.34	55.69	40.163	46.19	40.802	73.07	18.355	45.11
26.2	39.94	54.67	39.931	45.22	40.668	72.23	18.219	45.21
Dec. 6.2	39.61	53.18	39.729	43.78	40.559	71.14	18.113	45.17
16.1	39.35	51.28	39.562	41.89	40.479	69.82	18.041	44.99
26.1	39.17	49.00	39.435	39.61	40.430	68.32	18.005	44.68
36.1	39.09	46.43	39.353	37.02	40.416	66.67	18.006	44.25
Mean Place	35.121	57.18	38.164	12.18	37.845	46.40	14.607	58.37
Sec δ , Tan δ	2.508	-2.300	1.414	+1.000	1.034	+0.264	1.109	-0.478
$D\psi\alpha$, $D\omega\alpha$	+0.11	+0.10	+0.04	-0.04	+0.06	-0.01	+0.07	+0.02
$D\psi\delta$, $D\omega\delta$	+0.3	-0.8	+0.3	-0.8	+0.3	-0.8	+0.3	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Delphini seq. Mag. 4.5			ϵ Cygni. Mag. 2.6			δ Aquarii. Mag. 3.8			η Cephei. Mag. 3.6		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	20 42		+15 49	20 42		+33 39	20 43		- 9 47	20 43		+61 31
		s	"		s	"		s	"		s	"
Jan. 1.1	51.008		47.30	53.053		54.29	14.267		46.51	35.46		25.38
11.1	51.013	5	45.58	53.031	22	51.89	14.291	24	46.91	35.32	14	22.51
21.0	51.053	40	43.81	53.049	18	49.38	14.349	58	47.24	35.24	8	19.40
31.0	51.128	75	42.08	53.109	60	46.85	14.438	89	47.50	35.25	1	16.18
Feb. 10.0	51.236	108	40.46	53.210	101	44.40	14.560	122	47.62	35.34	9	12.98
		139	144		141	227		152	2		16	
19.9	51.375		39.02	53.351		42.13	14.712		47.60	35.50		9.94
Mar. 1.9	51.547	172	37.85	53.531	180	40.16	14.891	179	47.41	35.76	26	7.16
11.9	51.749	202	37.00	53.749	218	38.57	15.098	207	47.01	36.07	31	4.77
21.9	51.977	228	36.51	54.000	251	37.42	15.329	231	46.41	36.45	38	2.86
31.8	52.230	253	36.44	54.279	279	36.77	15.583	254	45.58	36.89	44	1.51
		273	34		304	13		274	103		47	
Apr. 10.8	52.503		36.78	54.583		36.64	15.857		44.55	37.36		0.76
20.8	52.793	290	37.54	54.905	322	37.06	16.148	291	43.34	37.87	51	0.64
30.8	53.096	303	38.69	55.238	333	38.01	16.451	303	41.97	38.38	51	1.16
May 10.7	53.403	307	40.21	55.576	338	39.44	16.760	309	40.48	38.90	52	2.29
20.7	53.707	304	42.03	55.910	334	41.31	17.069	309	38.91	39.40	50	3.99
		297	208		320	227		302	160		47	
30.7	54.004		44.11	56.230		43.58	17.371		37.31	39.87		6.21
June 9.6	54.285	281	46.38	56.532	302	46.17	17.660	289	35.74	40.31	44	8.88
19.6	54.543	258	48.78	56.804	272	49.00	17.928	268	34.22	40.68	37	11.93
29.6	54.772	229	51.25	57.043	239	52.01	18.169	241	32.80	41.00	32	15.26
July 9.6	54.965	193	53.72	57.240	197	55.11	18.376	207	31.52	41.23	23	18.81
		154	242		151	312		168	112		17	
19.5	55.119		56.14	57.391		58.23	18.544		30.40	41.40		22.47
29.5	55.229	110	58.45	57.493	102	61.29	18.669	125	29.46	41.49	9	26.17
Aug. 8.5	55.294	65	60.60	57.545	52	64.24	18.749	80	28.70	41.50	1	29.83
18.5	55.313	19	62.58	57.547	2	67.02	18.784	35	28.14	41.43	7	33.35
28.4	55.289	24	64.31	57.500	47	69.55	18.773	11	27.76	41.27	16	36.70
		65	149		92	228		51	21		22	
Sept. 7.4	55.224		65.80	57.408		71.83	18.722		27.55	41.05		39.77
17.4	55.124	100	67.01	57.277	131	73.78	18.634	88	27.49	40.77	28	42.51
27.3	54.994	130	67.95	57.114	163	75.37	18.515	119	27.57	40.43	34	44.88
Oct. 7.3	54.843	151	68.59	56.927	187	76.58	18.374	141	27.76	40.06	37	46.80
17.3	54.677	166	68.93	56.724	203	77.39	18.220	154	28.04	39.65	41	48.24
		170	3		209	38		158	34		43	
27.3	54.507		68.98	56.515		77.77	18.062		28.38	39.22		49.16
Nov. 6.2	54.342	165	68.72	56.307	208	77.72	17.908	154	28.77	38.80	42	49.53
16.2	54.187	155	68.17	56.111	196	77.24	17.766	142	29.19	38.37	43	49.34
26.2	54.051	136	67.33	55.932	179	76.32	17.645	121	29.64	37.98	39	48.58
Dec. 6.2	53.939	112	66.23	55.780	152	74.98	17.549	96	30.11	37.62	36	47.26
		83	133		122	171		66	47		32	
16.1	53.856		64.90	55.658		73.27	17.483		30.58	37.30		45.42
26.1	53.803	53	63.37	55.570	88	71.23	17.449	34	31.04	37.04	26	43.11
36.1	53.785	18	61.68	55.520	50	68.95	17.448	1	31.48	36.84	20	40.41
Mean Place	51.231		41.06	53.597		44.88	14.303		48.10	37.451		11.97
Sec δ , Tan δ	1.039		+0.284	1.201		+0.666	1.015		-0.173	2.097		+1.843
$D\psi \alpha$, $D\omega \alpha$	+0.06		-0.01	+0.05		-0.03	+0.06		+0.01	+0.02		-0.06
$D\psi \delta$, $D\omega \delta$	+0.3		-0.8	+0.3		-0.8	+0.3		-0.8	+0.3		-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington on Time.	μ Aquarii. Mag. 4.8		β Indi. Mag. 3.7		γ Vulpeculæ. Mag. 5.2		γ H ¹ . Draconis. Mag. 5.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 48	° ' " - 9 17	h m 20 48	° ' " -58 45	h m 20 51	° ' " +27 44	h m 20 51	° ' " +80 14
n. 1.1	13.920	29.08	24.115	56.71	3.517	51.37	13.50	59.69
11.1	13.940	29.50	24.100	54.38	3.498	49.21	12.83	56.96
21.0	13.992	29.85	24.156	51.85	3.516	46.95	12.38	53.92
31.0	14.078	30.11	24.278	49.20	3.572	44.67	12.17	50.70
eb. 10.0	14.194	30.25	24.466	46.49	3.665	42.47	12.20	47.42
20.0	14.340	30.25	24.714	43.77	3.796	40.46	12.49	44.22
ar. 1.9	14.515	30.05	25.018	41.10	3.963	38.72	13.00	41.23
11.9	14.717	29.66	25.373	38.55	4.165	37.32	13.74	38.56
21.9	14.944	29.05	25.775	36.14	4.398	36.34	14.67	36.32
31.8	15.195	28.23	26.217	33.93	4.660	35.83	15.74	34.59
pr. 10.8	15.466	27.19	26.693	31.96	4.946	35.81	16.96	33.43
20.8	15.754	25.96	27.198	30.26	5.252	36.30	18.23	32.89
30.8	16.056	24.58	27.721	28.87	5.570	37.26	19.54	33.00
ay 10.7	16.364	23.07	28.252	27.84	5.894	38.67	20.85	33.71
20.7	16.673	21.48	28.783	27.17	6.217	40.50	22.09	35.02
30.7	16.976	19.86	29.301	26.88	6.530	42.69	23.25	36.88
ine 9.7	17.266	18.25	29.795	26.99	6.826	45.16	24.29	39.23
19.6	17.537	16.69	30.252	27.47	7.097	47.84	25.17	41.99
29.6	17.780	15.23	30.662	28.33	7.337	50.67	25.87	45.11
ily 9.6	17.990	13.91	31.014	29.53	7.539	53.58	26.39	48.47
19.5	18.162	12.76	31.297	31.03	7.698	56.49	26.70	52.05
29.5	18.292	11.78	31.505	32.80	7.811	59.34	26.81	55.72
ug. 8.5	18.377	11.00	31.631	34.74	7.877	62.06	26.70	59.40
18.5	18.416	10.40	31.675	36.80	7.894	64.61	26.37	63.03
28.4	18.410	9.99	31.636	38.91	7.864	66.94	25.86	66.51
zpt. 7.4	18.364	9.77	31.519	40.97	7.792	69.00	25.15	69.79
17.4	18.279	9.70	31.330	42.90	7.681	70.76	24.28	72.81
27.4	18.164	9.76	31.079	44.61	7.539	72.20	23.26	75.46
ct. 7.3	18.027	9.94	30.783	46.04	7.371	73.28	22.10	77.74
17.3	17.875	10.22	30.454	47.11	7.189	73.99	20.86	79.56
27.3	17.718	10.56	30.110	47.77	7.000	74.31	19.55	80.87
ov. 6.2	17.564	10.95	29.765	47.99	6.811	74.24	18.21	81.63
16.2	17.422	11.39	29.438	47.75	6.632	73.79	16.87	81.82
26.2	17.300	11.86	29.144	47.06	6.471	72.93	15.56	81.44
ec. 6.2	17.201	12.34	28.896	45.93	6.331	71.72	14.32	80.46
16.1	17.132	12.83	28.704	44.40	6.220	70.16	13.21	78.91
26.1	17.095	13.31	28.574	42.53	6.141	68.32	12.23	76.85
36.1	17.090	13.77	28.512	40.35	6.096	66.24	11.43	74.37
n Place	13.943	30.79	24.687	51.55	3.894	42.52	21.084	43.95
δ , Tan δ	1.013	-0.164	1.928	-1.649	1.130	+0.526	5.905	+5.820
μ , D _a	+0.06	+0.01	+0.09	+0.07	+0.05	-0.02	-0.05	-0.26
μ , D _d	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7

APPARENT PLACES OF STARS, 1918.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cygni. Mag. 4.0			α Octantis. Mag. 5.2			γ Microscopii. Mag. 4.7			θ Capricorni. Mag. 4.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	20 54		+40 50	20 54		-77 19	20 56		-32 34	21 1		-17 33
Jan. 1.1	6.232		74.33	47.20		84.35	15.908		46.96	20.404		34.15
11.1	6.179	53	71.79	47.00	20	81.26	15.919	11	46.04	20.413	9	34.09
21.0	6.170	9	69.09	46.99	1	77.98	15.969	50	44.97	20.456	43	33.93
31.0	6.207	37	66.33	47.13	14	74.57	16.058	89	43.76	20.532	76	33.64
Feb. 10.0	6.291	84	63.62	47.44	31	71.13	16.184	126	42.43	20.640	108	33.24
		130	255		48			162			139	
20.0	6.421		61.07	47.92		67.76	16.346		41.01	20.779		32.69
Mar. 1.9	6.595	174	58.78	48.53	61	64.50	16.540	194	39.50	20.948	169	31.98
11.9	6.813	218	56.87	49.27	74	61.44	16.767	227	37.92	21.145	197	31.13
21.9	7.070	257	55.40	50.12	85	58.63	17.023	256	36.28	21.371	226	30.11
31.9	7.361	291	54.46	51.07	95	56.15	17.305	282	34.63	21.622	251	28.93
		320	41		104			308			273	
Apr. 10.8	7.681		54.05	52.11		54.02	17.613		32.98	21.895		27.63
20.8	8.023	342	54.22	53.20	109	52.30	17.940	327	31.38	22.187	292	26.21
30.8	8.380	357	54.94	54.33	113	51.01	18.283	343	29.84	22.495	308	24.71
May 10.7	8.742	362	56.21	55.48	115	50.18	18.636	353	28.41	22.812	317	23.18
20.7	9.100	358	57.97	56.62	114	49.84	18.991	355	27.12	23.133	321	21.64
		346	220		111			349			317	
30.7	9.446		60.17	57.73		49.96	19.340		26.02	23.450		20.14
June 9.7	9.772	326	62.75	58.78	105	50.57	19.677	337	25.13	23.755	305	18.72
19.6	10.066	294	65.62	59.73	95	51.63	19.992	315	24.48	24.043	288	17.43
29.6	10.324	258	68.72	60.59	86	53.13	20.280	288	24.08	24.305	262	16.31
July 9.6	10.538	214	71.96	61.32	73	55.00	20.530	250	23.94	24.535	230	15.36
		165	331		58			207			191	
19.5	10.703	113	75.27	61.90	40	57.20	20.737	160	24.05	24.726	148	14.62
29.5	10.816	58	78.57	62.30	23	59.67	20.897	107	24.41	24.874	103	14.08
Aug. 8.5	10.874	4	81.78	62.53	4	62.31	21.004	54	24.97	24.977	55	13.77
18.5	10.878	4	84.84	62.57	4	65.05	21.058	54	25.73	25.032	55	13.64
28.4	10.829	49	87.69	62.43	14	67.76	21.059	1	26.62	25.040	8	13.70
		97	258		33			48			36	
Sept. 7.4	10.732		90.27	62.10		70.36	21.011		27.60	25.004		13.92
17.4	10.593	139	92.54	61.60	50	72.76	20.918	93	28.62	24.928	76	14.26
27.4	10.416	177	94.46	60.97	63	74.83	20.786	132	29.62	24.818	110	14.69
Oct. 7.3	10.211	205	95.97	60.21	76	76.51	20.625	161	30.55	24.683	135	15.17
17.3	9.987	224	97.04	59.37	84	77.71	20.445	180	31.36	24.531	152	15.68
		234	63		90			189			159	
27.3	9.753		97.67	58.47		78.39	20.256		32.00	24.372		16.18
Nov. 6.2	9.517	236	97.82	57.55	92	78.49	20.069	187	32.46	24.213	159	16.64
16.2	9.290	227	97.49	56.67	88	78.00	19.894	175	32.70	24.063	150	17.06
26.2	9.079	211	96.68	55.84	83	76.93	19.740	154	32.73	23.931	132	17.41
Dec. 6.2	8.892	187	95.40	55.10	74	75.31	19.613	127	32.52	23.824	107	17.68
		157	171		61			94			79	
16.1	8.735		93.69	54.49		73.20	19.519		32.11	23.745		17.87
26.1	8.614	121	91.61	54.03	46	70.65	19.463	56	31.49	23.696	49	17.98
36.1	8.532	82	89.22	53.73	30	67.77	19.446	17	30.69	23.682	14	18.00
Mean Place	6.925		62.96	49.790		77.99	15.945		44.62	20.376		34.36
Sec δ , Tan δ	1.322		+0.865	4.561		-4.450	1.187		-0.639	1.049		-0.316
$D\psi\alpha$, $D\omega\alpha$	+0.04		-0.04	+0.15		+0.20	+0.07		+0.03	+0.07		+0.02
$D\psi\delta$, $D\omega\delta$	+0.3		-0.7	+0.3		-0.7	+0.3		-0.7	+0.3		-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Cygni. Mag. 3.9			61 Cygni pr. Mag. 5.6			γ Aquarii. Mag. 4.5			Bradley 2777. Mag. 5.9		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 21 1	s 43 35	° "	h m 21 3	s 38 20	° "	h m 21 5	s 11 41	° "	h m 21 7	s 47 47	° "
Jan. 1.1	56.118	70	73.34	12.574	41	55.07	7.752	74.17	4.57	55.83		
11.1	56.048	24	70.80	12.533	233	52.74	7.757	74.43	4.00	53.17	266	
21.0	56.024	23	68.07	12.532	1	50.25	7.794	74.61	3.61	50.21	296	
31.0	56.047	23	65.26	12.576	44	47.69	7.863	74.70	3.39	47.03	318	
Feb. 10.0	56.119	72	62.47	12.664	88	45.17	7.962	74.65	3.36	43.76	327	
		121			131						323	
20.0	56.240		59.83	12.795		42.81	8.093	74.45	3.54	40.53		
Mar. 1.9	56.408	168	57.43	12.970	175	40.72	8.253	74.07	3.90	37.47	306	
		215			217						277	
11.9	56.623	257	55.39	13.187	174	38.98	8.442	73.51	4.45	34.70	277	
21.9	56.880	294	53.79	13.442	181	37.67	8.658	72.74	5.15	32.33	237	
31.9	57.174	326	52.70	13.730	27	36.86	8.899	71.77	5.99	30.47	186	
					318						133	
Apr. 10.8	57.500		52.15	14.048		36.59	9.165	70.61	6.94	29.15	70	
20.8	57.851	351	52.19	14.388	28	36.87	9.449	69.29	7.96	28.45	8	
30.8	58.217	366	52.80	14.745	82	37.69	9.749	67.82	9.03	28.37		
May 10.7	58.592	375	53.95	15.108	135	39.04	10.059	66.25	10.10	28.92	55	
20.7	58.964	372	55.63	15.470	184	40.88	10.372	64.63	11.15	30.07	115	
		360			226						172	
30.7	59.324		57.77	15.820		43.14	10.683	62.99	12.12	31.79		
June 9.7	59.663	339	60.30	16.152	263	45.77	10.983	61.39	13.01	34.01	222	
19.6	59.972	309	63.16	16.456	292	48.69	11.265	59.86	13.80	36.69	268	
29.6	60.244	272	66.27	16.725	314	51.83	11.523	58.45	14.45	39.73	304	
July 9.6	60.471	227	69.55	16.953	228	55.10	11.748	57.19	14.95	43.06	333	
		177			180						355	
19.6	60.648	122	72.91	17.133	131	58.43	11.938	56.12	15.30	46.61	368	
29.5	60.770	67	76.29	17.264	331	61.74	12.084	55.24	15.48	50.29	373	
Aug. 8.5	60.837	11	79.60	17.341	24	64.98	12.186	54.57	15.48	54.02	370	
18.5	60.848	44	82.78	17.365	25	68.05	12.242	54.09	15.32	57.72	358	
28.4	60.804	96	85.75	17.340	74	70.93	12.253	53.80	15.00	61.30	341	
					260							
Sept. 7.4	60.708		88.48	17.266		73.53	12.220	53.71	14.51	64.71	315	
17.4	60.568	140	90.89	17.149	117	75.84	12.149	53.76	13.89	67.86	284	
27.4	60.389	179	92.94	16.999	150	77.79	12.046	53.94	13.15	70.70	245	
Oct. 7.3	60.178	211	94.60	16.817	182	79.35	11.916	54.23	12.29	73.15	200	
17.3	59.947	244	95.82	16.618	199	80.49	11.771	54.59	11.86	75.15	151	
					211							
27.3	59.703		96.59	16.407		81.20	11.618	55.01	10.36	76.66	97	
Nov. 6.3	59.456	247	96.87	16.196	211	81.45	11.465	55.45	9.32	77.63	39	
16.2	59.215	227	96.65	15.991	205	81.23	11.321	55.90	8.27	78.02	19	
26.2	58.988	203	95.94	15.801	167	80.55	11.193	56.35	7.24	77.83	78	
Dec. 6.2	58.785	174	94.75	15.634	140	79.43	11.087	56.79	6.26	77.05	137	
					154							
16.1	58.611		93.10	15.494		77.89	11.009	57.20	5.37	75.68	191	
26.1	58.471	140	91.05	15.389	105	75.99	10.958	57.57	4.57	73.77	230	
36.1	58.372	99	88.67	15.320	69	73.78	10.940	57.90	3.90	71.38		
Mean Place	56.856		60.97	13.151		43.75	7.716	75.54	10.054	38.75		
Sec δ , Tan δ	1.381		+0.952	1.275		+0.791	1.021	-0.207	4.732	+4.625		
$D\phi\alpha$, $D_\alpha\alpha$	+0.04		-0.05	+0.05		-0.04	+0.06	+0.01	-0.02	-0.22		
$D\phi\delta$, $D_\alpha\delta$	+0.3		-0.7	+0.3		-0.7	+0.3	-0.7	+0.3	-0.7		

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Piscis Australis. Mag. 5.6		ζ Cygni. Mag. 3.4		τ Cygni. Mag. 3.8		α Equulei. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 8	° ' " -27 56	h m 21 9	° ' " +29 53	h m 21 11	° ' " +37 41	h m 21 11	° ' " +4 54
	s	"	s	"	s	"	s	"
Jan. 1.1	25.796	78.03	26.396	34.01	30.532	53.35	43.494	34.43
11.1	25.796	77.38	26.357	31.87	30.473	51.04	43.484	33.32
21.1	25.833	76.59	26.352	29.61	30.452	48.54	43.507	32.20
31.0	25.906	75.66	26.386	27.29	30.474	45.96	43.559	31.13
Feb. 10.0	26.014	74.60	26.459	25.03	30.539	43.40	43.644	30.17
20.0	26.154	73.39	26.570	22.92	30.648	40.97	43.758	29.38
Mar. 1.9	26.328	72.07	26.719	21.05	30.800	38.80	43.903	28.80
11.9	26.534	70.66	26.905	19.51	30.994	36.94	44.079	28.49
21.9	26.768	69.15	27.126	18.38	31.226	35.50	44.283	28.47
31.9	27.030	67.57	27.380	17.70	31.494	34.55	44.514	28.78
Apr. 10.8	27.317	65.94	27.660	17.51	31.794	34.12	44.769	29.42
20.8	27.626	64.31	27.964	17.82	32.118	34.23	45.045	30.36
30.8	27.952	62.70	28.284	18.63	32.459	34.87	45.336	31.61
May 10.8	28.289	61.15	28.613	19.91	32.811	36.05	45.639	33.13
20.7	28.631	59.70	28.944	21.63	33.163	37.70	45.945	34.88
30.7	28.970	58.39	29.269	23.73	33.508	39.80	46.248	36.79
June 9.7	29.299	57.27	29.578	26.14	33.836	42.26	46.541	38.81
19.6	29.609	56.34	29.866	28.80	34.139	45.03	46.817	40.90
29.6	29.895	55.64	30.123	31.64	34.409	48.03	47.067	42.99
July 9.6	30.146	55.19	30.343	34.58	34.638	51.16	47.287	45.03
19.6	30.357	55.00	30.522	37.55	34.823	54.37	47.471	46.99
29.5	30.522	55.05	30.655	40.49	34.959	57.59	47.613	48.80
Aug. 8.5	30.638	55.34	30.740	43.34	35.043	60.75	47.713	50.44
18.5	30.704	55.81	30.775	46.03	35.074	63.75	47.767	51.89
28.4	30.719	56.46	30.764	48.51	35.054	66.58	47.778	53.12
Sept. 7.4	30.686	57.24	30.707	50.75	34.986	69.15	47.747	54.13
17.4	30.609	58.09	30.611	52.70	34.875	71.44	47.679	54.91
27.4	30.495	58.97	30.480	54.32	34.728	73.37	47.580	55.48
Oct. 7.3	30.352	59.83	30.322	55.59	34.550	74.94	47.455	55.82
17.3	30.187	60.61	30.145	56.50	34.351	76.10	47.314	55.94
27.3	30.013	61.28	29.958	57.01	34.139	76.83	47.164	55.87
Nov. 6.3	29.839	61.83	29.769	57.12	33.924	77.11	47.014	55.59
16.2	29.674	62.21	29.585	56.81	33.715	76.93	46.870	55.13
26.2	29.525	62.40	29.415	56.11	33.517	76.30	46.740	54.49
Dec. 6.2	29.402	62.41	29.264	55.02	33.338	75.21	46.630	53.70
16.1	29.308	62.23	29.138	53.57	33.186	73.72	46.543	52.78
26.1	29.247	61.88	29.041	51.80	33.065	71.85	46.484	51.76
36.1	29.221	61.36	28.977	49.77	32.979	69.65	46.454	50.64
Mean Place	25.770	76.27	26.728	23.71	31.030	41.41	43.505	29.40
Sec δ , Tan δ	1.132	-0.531	1.154	+0.575	1.264	+0.773	1.004	+0.086
$D\alpha$, D_{α}	+0.07	+0.03	+0.05	-0.03	+0.05	-0.04	+0.06	0.00
$D\delta$, D_{δ}	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	σ Cygni. Mag. 4.3		θ Microscopii. Mag. 4.9		α Cephei. Mag. 2.6		ϵ Capricorni. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 14	° ' " +39 2	h m 21 15	° ' " -41 9	h m 21 16	° ' " +62 14	h m 21 17	° ' " -17 10
a. 1.1	11.136 67	74.52 235	31.079 19	29.02 135	35.73 21	32.44 263	41.077 6	63.82 4
11.1	11.069 26	72.17 255	31.060 24	27.67 156	35.52 13	29.81 263	41.071 26	63.78 15
21.1	11.043 16	69.62 263	31.084 67	26.11 173	35.39 2	26.88 312	41.097 58	63.63 28
31.0	11.059 60	66.99 240	31.151 109	24.38 187	35.33 6	23.76 319	41.155 89	63.35 43
b. 10.0	11.119 105	64.39 260	31.260 149	22.51 198	35.35 11	20.57 312	41.244 123	62.92 58
20.0	11.224 150	61.90 225	31.409 187	20.53 204	35.46 19	17.45 294	41.367 152	62.34 73
yr. 1.9	11.374 192	59.65 194	31.596 225	18.49 209	35.65 26	14.51 262	41.519 181	61.61 89
11.9	11.566 232	57.71 151	31.821 261	16.40 209	35.91 34	11.89 221	41.700 211	60.72 107
21.9	11.798 271	56.20 103	32.082 294	14.31 207	36.25 41	9.68 171	41.911 237	59.65 123
31.9	12.069 302	55.17 51	32.376 322	12.24 199	36.66 46	7.97 114	42.148 263	58.42 136
yr. 10.8	12.371 327	54.66 5	32.698 348	10.25 180	37.12 49	6.83 54	42.411 284	57.06 149
20.8	12.698 346	54.71 59	33.046 368	8.36 174	37.61 53	6.29 10	42.695 303	55.57 158
30.8	13.044 356	55.30 112	33.414 382	6.62 154	38.14 53	6.39 70	42.998 314	53.99 162
ay 10.8	13.400 358	56.42 161	33.796 387	5.08 133	38.67 53	7.09 129	43.312 321	52.37 163
20.7	13.758 349	58.03 206	34.183 387	3.75 106	39.20 51	8.38 185	43.638 319	50.74 159
30.7	14.107 333	60.09 244	34.570 376	2.69 77	39.71 48	10.23 234	43.952 311	49.15 151
ne 9.7	14.440 308	62.53 275	34.946 356	1.92 47	40.19 44	12.57 277	44.263 295	47.64 139
19.6	14.748 274	65.28 300	35.302 328	1.45 15	40.63 36	15.34 311	44.558 272	46.25 122
29.6	15.022 235	68.28 315	35.630 290	1.30 16	40.99 32	18.45 338	44.830 241	45.03 104
ly 9.6	15.257 188	71.43 323	35.920 245	1.46 47	41.31 24	21.83 358	45.071 204	43.99 83
19.6	15.445 138	74.66 326	36.165 194	1.93 75	41.55 15	25.41 367	45.275 163	43.16 60
29.5	15.583 86	77.92 319	36.359 137	2.68 100	41.70 8	29.08 370	45.438 117	42.56 38
ig. 8.5	15.669 33	81.11 305	36.496 79	3.68 121	41.78 0	32.78 364	45.555 70	42.18 17
18.5	15.702 19	84.16 288	36.575 20	4.89 136	41.78 8	36.42 351	45.625 24	42.01 3
28.5	15.683 68	87.04 262	36.595 37	6.25 144	41.70 17	39.93 330	45.649 21	42.04 21
pt. 7.4	15.615 113	89.66 234	36.558 88	7.69 145	41.53 23	43.23 302	45.628 62	42.25 33
17.4	15.502 149	92.00 199	36.470 134	9.14 141	41.30 29	46.25 269	45.566 96	42.58 45
27.4	15.353 179	93.99 162	36.336 171	10.55 130	41.01 33	48.94 230	45.470 125	43.03 52
st. 7.3	15.174 202	95.61 121	36.165 196	11.85 110	40.68 38	51.24 184	45.345 144	43.55 55
17.3	14.972 216	96.82 78	35.969 212	12.95 89	40.30 41	53.08 135	45.201 153	44.10 55
27.3	14.756 220	97.60 32	35.757 215	13.84 60	39.89 41	54.43 83	45.048 156	44.65 52
iv. 6.3	14.536 216	97.92 14	35.542 207	14.44 30	39.48 42	55.26 26	44.892 149	45.17 48
16.2	14.320 204	97.78 62	35.335 190	14.74 0	39.06 39	55.52 32	44.743 135	45.65 41
26.2	14.116 185	97.16 107	35.145 162	14.74 34	38.64 35	55.20 146	44.608 89	46.06 23
sc. 6.2	13.931 159	96.09 150	34.983 128	14.40 64	38.25 35	54.31 146	44.494 89	46.39 23
16.2	13.772 128	94.59 187	34.855 92	13.76 93	37.90 31	52.85 196	44.405 59	46.62 14
26.1	13.644 94	92.72 221	34.763 49	12.83 119	37.59 24	50.89 241	44.346 29	46.76 5
36.1	13.550	90.51	34.714	11.64	37.35	48.48	44.317	46.81
Place	11.656	62.15	31.132	24.94	37.457	16.14	40.995	64.09
δ , Tan δ	1.288	+0.811	1.328	-0.874	2.148	+1.900	1.047	-0.309
δ , D. α	+0.05	-0.04	+0.08	+0.04	+0.03	-0.10	+0.07	+0.02
δ , D. δ	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	1 Pegasi. Mag. 4.2			γ Pavonis. Mag. 4.3			ζ Capricorni. Mag. 3.9			ϵ Cygni. Mag. 5.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	21 18		+19 27	21 19		-65 43	21 21		-22 45	21 26		+46 10
Jan. 1.1	17.514		19.52	40.07		85.17	59.412		62.82	24.689		57.43
11.1	17.485	29	17.80	39.95	12	82.62	59.401	11	62.48	24.584	105	55.04
21.1	17.487	2	16.00	39.92	3	79.81	59.424	23	62.00	24.523	61	52.39
31.0	17.523	36	14.18	39.98	6	76.79	59.479	55	61.37	24.510	13	49.61
Feb. 10.0	17.593	70	12.44	40.11	13	73.68	59.566	87	60.59	24.547	37	46.79
		104			21			121			89	
20.0	17.697		10.85	40.32		70.51	59.687		59.67	24.636		44.06
Mar. 1.9	17.834	137	9.48	40.62	30	67.37	59.839	152	58.60	24.777	141	41.54
11.9	18.006	172	8.42	40.98	36	64.33	60.021	182	57.38	24.969	192	39.31
21.9	18.209	203	7.72	41.43	43	61.43	60.235	214	56.04	25.207	238	37.49
31.9	18.442	233	7.41	41.90	49	58.75	60.476	241	54.57	25.489	282	36.14
		260			54			260			322	
Apr. 10.8	18.702		7.54	42.44		56.31	60.745		53.01	25.811		35.32
20.8	18.985	283	8.09	43.02	58	54.19	61.035	290	51.37	26.164	353	35.07
30.8	19.286	301	9.06	43.63	61	52.42	61.346	311	49.70	26.538	374	35.39
May 10.8	19.597	311	10.43	44.27	64	51.02	61.669	323	48.04	26.925	387	36.29
20.7	19.912	315	12.15	44.92	63	50.05	61.999	330	46.44	27.317	392	37.72
		313			63			330			394	
30.7	20.225		14.18	45.55		49.52	62.329		44.93	27.701		39.64
June 9.7	20.525	300	16.45	46.17	62	49.43	62.651	322	43.55	28.068	367	41.98
19.6	20.809	284	18.89	46.76	59	49.80	62.957	306	42.35	28.408	340	44.71
29.6	21.065	256	21.46	47.29	53	50.60	63.241	284	41.34	28.713	305	47.73
July 9.6	21.289	224	24.07	47.75	46	51.80	63.492	251	40.56	28.974	261	50.96
		187			40			214			211	
19.6	21.476	144	26.66	48.15	30	53.38	63.706	172	40.02	29.185	158	54.33
29.5	21.620	99	29.19	48.45	21	55.26	63.878	126	39.72	29.343	101	57.75
Aug. 8.5	21.719	53	31.59	48.66	11	57.41	64.004	77	39.66	29.444	41	61.16
18.5	21.772		33.83	48.77		59.72	64.081		39.82	29.485		64.48
28.5	21.780	8	35.85	48.78	1	62.12	64.109	28	40.16	29.470	15	67.64
		34			11			19			68	
Sept. 7.4	21.746		37.64	48.67		64.52	64.090		40.67	29.402		70.58
17.4	21.673	73	39.16	48.48	19	66.82	64.029	61	41.30	29.284	118	73.24
27.4	21.566	107	40.39	48.20	28	68.91	63.932	97	42.01	29.123	161	75.57
Oct. 7.3	21.434	132	41.33	47.86	34	70.73	63.805	127	42.75	28.926	197	77.53
17.3	21.284	150	41.95	47.45	41	72.17	63.657	148	43.46	28.702	224	79.07
		161			43			160			241	
27.3	21.123		42.26	47.02		73.18	63.497		44.13	28.461		80.15
Nov. 6.3	20.959	164	42.25	46.57	45	73.71	63.334	163	44.72	28.210	251	80.75
16.2	20.801	158	41.91	46.12	45	73.71	63.178	156	45.20	27.959	251	80.85
26.2	20.654	147	41.25	45.71	41	73.19	63.035	143	45.55	27.717	212	80.44
Dec. 6.2	20.524	130	40.31	45.33	38	72.16	62.914	121	45.75	27.492	225	79.53
		106			30			97			200	
16.2	20.418		39.08	45.03		70.65	62.817		45.82	27.292		78.13
26.1	20.338	80	37.63	44.76	27	68.69	62.751	66	45.73	27.123	169	76.30
36.1	20.286	52	35.97	44.58	18	66.37	62.716	35	45.50	26.990	133	74.08
Mean Place	17.638		11.02	40.868		78.14	59.323		61.92	25.354		42.94
Sec δ , Tan δ	1.061		+0.353	2.433		-2.218	1.084		-0.420	1.444		+1.042
$D\psi a$, $D_{\omega} a$	+0.05		-0.02	+0.10		+0.11	+0.07		+0.02	+0.04		-0.05
$D\psi \delta$, $D_{\omega} \delta$	+0.3		-0.6	+0.3		-0.6	+0.3		-0.6	+0.3		-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Aquarii. Mag. 3.1			β Cephei. Mag. 3.3			ξ Aquarii. Mag. 4.8			74 Cygni. Mag. 5.1		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 21 27	s — 5 55	° ' "	h m 21 27	s +70 11	° ' "	h m 21 33	s — 8 12	° ' "	h m 21 33	s +40 2	° ' "
Jan. 1.1	14.702	54.54	33.85	80.12	23.416	78.88	39.273	54.38	224			
11.1	14.687	55.09	33.50	77.61	23.396	79.31	39.185	52.14	246			
21.1	14.701	55.58	33.25	74.75	23.406	79.67	39.134	49.68	260			
31.0	14.744	55.98	33.10	71.64	23.444	79.91	39.126	47.08	259			
Feb. 10.0	14.819	56.24	33.06	68.41	23.514	80.03	39.161	44.49	253			
20.0	14.923	56.36	33.15	65.19	23.613	79.98	39.242	41.96	233			
Mar. 2.0	15.057	56.28	33.35	62.11	23.743	79.74	39.368	39.63	202			
11.9	15.222	55.97	33.66	59.29	23.903	79.30	39.541	37.61	165			
21.9	15.415	55.44	34.08	56.85	24.092	78.63	39.757	35.96	118			
31.9	15.637	54.65	34.59	54.88	24.311	77.74	40.013	34.78	68			
Apr. 10.8	15.885	53.63	35.18	53.46	24.555	76.62	40.306	34.10	14			
20.8	16.155	52.37	35.83	52.63	24.824	75.31	40.627	33.96	40			
30.8	16.444	50.93	36.52	52.42	25.112	73.81	40.973	34.36	95			
May 10.8	16.747	49.31	37.22	52.85	25.415	72.17	41.332	35.31	144			
20.7	17.056	47.59	37.92	53.87	25.725	70.43	41.697	36.75	190			
30.7	17.366	45.79	38.59	55.48	26.037	68.64	42.059	38.65	231			
June 9.7	17.667	43.97	39.22	57.60	26.341	66.86	42.406	40.96	265			
19.7	17.955	42.18	39.79	60.19	26.634	65.12	42.731	43.61	291			
29.6	18.221	40.46	40.29	63.17	26.906	63.48	43.026	46.52	311			
July 9.6	18.458	38.87	40.70	66.46	27.149	61.96	43.282	49.63	322			
19.6	18.660	37.42	41.02	69.99	27.357	60.61	43.494	52.85	326			
29.5	18.822	36.16	41.23	73.67	27.526	59.47	43.657	56.11	323			
Aug. 8.5	18.941	35.10	41.32	77.42	27.653	58.52	43.768	59.34	314			
18.5	19.016	34.24	41.32	81.16	27.735	57.80	43.826	62.48	297			
28.5	19.045	33.61	41.21	84.81	27.772	57.28	43.831	65.45	276			
Sept. 7.4	19.032	33.17	41.00	88.29	27.765	56.98	43.787	68.21	248			
17.4	18.981	32.94	40.68	91.54	27.720	56.86	43.696	70.69	216			
27.4	18.895	32.87	40.29	94.48	27.639	56.91	43.564	72.85	181			
Oct. 7.4	18.782	32.96	39.83	97.05	27.530	57.11	43.400	74.66	141			
17.3	18.650	33.19	39.31	99.20	27.401	57.42	43.211	76.07	99			
27.3	18.507	33.51	38.74	100.86	27.260	57.81	43.003	77.06	53			
Nov. 6.3	18.361	33.94	38.15	101.99	27.115	58.27	42.788	77.59	7			
16.2	18.221	34.43	37.54	102.55	26.974	58.78	42.572	77.66	41			
26.2	18.091	34.97	36.94	102.51	26.843	59.31	42.365	77.25	87			
Dec. 6.2	17.980	35.55	36.36	101.89	26.730	59.86	42.171	76.38	132			
16.2	17.889	36.15	35.82	100.69	26.637	60.39	42.000	75.06	172			
26.1	17.825	36.76	35.34	98.92	26.570	60.92	41.854	73.34	208			
36.1	17.789	37.35	34.93	96.67	26.528	61.40	41.741	71.26				
Mean Place	14.602	57.37	36.517	62.00	23.285	81.23	39.695	40.61				
Sec δ , Tan δ	1.005	-0.104	2.952	+2.778	1.010	-0.144	1.306	+0.841				
$D\psi\alpha$, $D\omega\alpha$	+0.06	+0.01	+0.02	-0.15	+0.06	+0.01	+0.05	-0.04				
$D\psi\delta$, $D\omega\delta$	+0.3	-0.6	+0.3	-0.6	+0.3	-0.8	+0.3	-0.8				

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Capricorni. Mag. 3.8			ε Pegasi. Mag. 2.5			11 Cephei. Mag. 4.8			δ Capricorni. Mag. 3.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	21 35		-17 1	21 40		+ 9 29	21 40		+70 55	21 42		-16 29
		"	"		"	"		"	"		"	"
Jan. 1.1	33.151		59.43	9.574		61.28	40.93		80.24	31.186		59.62
11.1	33.130	21	59.41	9.539	35	60.04	40.54	39	77.89	31.159	27	59.64
21.1	33.138	40	59.26	9.532	7	58.78	40.25	19	75.15	31.161	2	59.54
31.0	33.178	8	58.96	9.555	23	57.53	40.06	29	72.12	31.193	32	59.28
Feb. 10.0	33.250	72	58.53	9.608	53	56.37	39.98	8	68.94	31.257	64	58.88
		102			84			4			93	
20.0	33.352		57.93	9.692		55.35	40.02		65.72	31.350		58.31
Mar. 2.0	33.484	132	57.16	9.809	117	54.54	40.20	18	62.62	31.475	125	57.56
11.9	33.648	164	56.22	9.958	149	53.99	40.49	29	59.73	31.632	157	56.64
21.9	33.842	194	55.09	10.138	180	53.74	40.89	40	57.19	31.819	187	55.52
31.9	34.066	224	53.81	10.350	212	53.82	41.39	50	55.09	32.036	217	54.24
		251			238			58			246	
Apr. 10.9	34.317		52.38	10.588		54.26	41.97		53.52	32.282		52.81
20.8	34.591	274	50.82	10.853	265	55.05	42.62	65	52.51	32.553	271	51.24
30.8	34.886	295	49.16	11.138	285	56.18	43.33	71	52.13	32.845	292	49.56
May 10.8	35.197	311	47.45	11.438	300	57.61	44.05	72	52.37	33.154	309	47.83
20.7	35.516	319	45.73	11.747	309	59.32	44.78	73	53.21	33.473	319	46.08
		322			309			71			322	
30.7	35.838		44.05	12.056		61.25	45.49		54.65	33.795		44.37
June 9.7	36.155	317	42.46	12.359	303	63.35	46.15	66	56.62	34.113	318	42.74
19.7	36.457	302	40.98	12.649	290	65.55	46.77	62	59.06	34.417	304	41.22
29.6	36.740	283	39.66	12.917	268	67.81	47.31	54	61.93	34.703	286	39.86
July 9.6	36.993	253	38.54	13.157	240	70.06	47.77	46	65.13	34.961	258	38.70
		219			206			36			223	
19.6	37.212		37.63	13.363		72.25	48.13		68.60	35.184		37.75
29.6	37.391	170	36.97	13.529	166	74.32	48.37	24	72.24	35.368	184	37.05
Aug. 8.5	37.525	134	36.53	13.653	124	76.26	48.52	15	75.99	35.509	141	36.57
18.5	37.613	89	36.33	13.731	81	78.02	48.56	4	79.75	35.604	95	36.33
28.5	37.654	41	36.34	13.770	36	79.55	48.48	8	83.45	35.652	48	36.31
		4			6			18			2	
Sept. 7.4	37.650		36.54	13.764		80.88	48.30		87.01	35.654		36.49
17.4	37.605	45	36.89	13.720	44	81.95	48.01	29	90.37	35.615	39	36.83
27.4	37.523	82	37.37	13.640	80	82.79	47.64	37	93.44	35.539	76	37.30
Oct. 7.4	37.411	112	37.93	13.535	105	83.37	47.20	44	96.16	35.433	106	37.86
17.3	37.278	133	38.54	13.407	128	83.71	46.68	52	98.48	35.304	129	38.48
		147			140			58			142	
27.3	37.131		39.15	13.267		83.82	46.12		100.32	35.162		39.11
Nov. 6.3	36.980	151	39.74	13.122	145	83.68	45.52	60	101.65	35.014	148	39.73
16.3	36.832	148	40.29	12.979	143	83.34	44.90	62	102.42	34.867	147	40.30
26.2	36.695	137	40.76	12.844	135	82.77	44.28	62	102.60	34.731	136	40.81
Dec. 6.2	36.576	119	41.15	12.724	120	82.00	43.67	61	102.17	34.611	120	41.24
		98			103			57			101	
16.2	36.478		41.44	12.621		81.06	43.10		101.16	34.510		41.58
26.1	36.407	71	41.61	12.542	79	79.97	42.58	62	99.58	34.435	75	41.79
36.1	36.364	43	41.69	12.487	55	78.76	42.13	45	97.48	34.386	49	41.91
Mean Place	33.003		59.72	9.499		54.41	43.503		61.05	31.012		60.02
Sec δ , Tan δ	1.046		-0.306	1.014		+0.167	3.062		+2.894	1.043		-0.296
$D\psi\alpha$, $D\omega\alpha$	+0.07		+0.02	+0.06		-0.01	+0.02		-0.16	+0.06		+0.02
$D\psi\delta$, $D\omega\delta$	+0.3		-0.6	+0.3		-0.6	+0.3		-0.6	+0.3		-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π^2 Cygni. Mag. 4.3		μ Capricorni. Mag. 5.2		γ Gruis. Mag. 3.2		16 Pegasi. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 43	° ' " +48 55	h m 21 48	° ' " -13 55	h m 21 48	° ' " -37 44	h m 21 49	° ' " +25 32
	s "	"	s "	"	s "	"	s "	"
Jan. 1.1	45.122	136	49.813	32	58.165	68.65	19.766	31.33
11.1	44.986	92	49.781	14	58.113	106	19.703	176
21.1	44.894	259	49.777	2	58.098	130	19.669	191
31.0	44.851	277	49.804	11	58.121	152	19.667	199
Feb. 10.0	44.859	8	49.860	27	58.181	172	19.700	197
	63	281	85	42	99	187	69	187
20.0	44.922	49.85	49.945	76.91	58.280	61.18	19.769	21.83
Mar. 2.0	45.041	119	50.063	118	58.417	137	19.875	168
11.9	45.215	174	50.212	149	58.591	174	20.017	142
21.9	45.443	228	50.391	179	58.803	212	20.198	107
31.9	45.720	277	50.601	210	59.050	247	20.413	66
	322	105	238	137	279	218	249	24
Apr. 10.9	46.042	40.18	50.839	71.93	59.329	50.55	20.662	16.76
20.8	46.399	357	51.104	152	59.640	48.43	20.938	22
30.8	46.784	385	51.390	166	59.976	46.41	21.239	67
May 10.8	47.188	404	51.694	174	60.333	44.53	21.555	112
20.7	47.598	410	52.009	178	60.701	42.85	21.881	152
	407	173	319	178	374	145	328	188
30.7	48.005	43.40	52.328	63.45	61.075	41.40	22.209	22.17
June 9.7	48.396	391	52.643	173	61.446	40.22	22.530	220
19.7	48.764	368	52.947	163	61.804	39.32	22.835	244
29.6	49.096	332	53.233	148	62.139	38.76	23.119	263
July 9.6	49.385	289	53.491	132	62.444	38.53	23.371	274
	240	315	226	110	266	10	216	279
19.6	49.625	184	53.717	89	62.710	38.63	23.587	34.97
29.6	49.809	126	53.905	64	62.931	39.04	23.762	277
Aug. 8.5	49.935	67	54.049	41	63.100	39.76	23.892	270
18.5	50.002	7	54.149	18	63.216	40.72	23.975	257
28.5	50.009	51	54.203	2	63.275	41.91	24.013	240
		309	9		4	133	8	216
Sept. 7.4	49.958	74.36	54.212	54.09	63.279	43.24	24.005	47.57
17.4	49.855	103	54.179	20	63.232	44.66	23.957	193
27.4	49.705	150	54.109	35	63.138	46.11	23.872	163
Oct. 7.4	49.517	188	54.010	46	63.005	47.51	23.758	134
17.3	49.295	222	53.887	54	62.842	48.80	23.618	99
	243	133	137	58	183	111	155	65
27.3	49.052	85.07	53.750	56.22	62.659	49.91	23.463	54.11
Nov. 6.3	48.793	259	53.606	59	62.466	50.81	23.299	29
16.3	48.531	262	53.463	57	62.273	51.42	23.136	6
26.2	48.274	257	53.329	54	62.089	51.75	22.978	42
Dec. 6.2	48.028	246	53.209	48	61.924	51.78	22.831	78
	226	120	101	41	141	28	130	111
16.2	47.802	84.20	53.108	58.81	61.783	51.50	22.701	52.03
26.1	47.605	197	53.031	32	61.671	50.90	22.592	140
36.1	47.442	163	52.978	22	61.594	50.04	22.509	166
Mean Place	45.754	47.04	49.614	78.57	58.055	64.35	19.810	20.09
Sec δ , Tan δ	1.522	+1.148	1.030	-0.248	1.264	-0.774	1.108	+0.478
$D\psi a$, $D\omega a$	+0.04	-0.06	+0.06	+0.01	+0.07	+0.04	+0.05	-0.03
$D\psi \delta$, $D\omega \delta$	+0.3	-0.6	+0.3	-0.5	+0.3	-0.5	+0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	79 Draconis. Mag. 6.6		20 Pegasi. Mag. 5.7		ε Indi. Mag. 4.7		α Aquarii. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 51	° ' " +73 18	h m 21 57	° ' " +12 43	h m 21 57	° ' " -57 6	h m 22 1	° ' " - 0 42
	s "	"	s "	"	s "	"	s "	"
Jan. 1.1	47.12	71.28	5.770	43.89	5.524	92.56	34.603	62.60
11.1	46.63 49	69.06 222	5.720 50	42.59 130	5.410 114	90.70 186	34.560 43	63.35 75
21.1	46.25 38	66.41 265	5.697 23	41.23 136	5.350 60	88.51 219	34.542 18	64.05 70
31.1	45.98 27	63.45 296	5.701 4	39.87 136	5.350 0	86.06 245	34.550 8	64.70 65
Feb. 10.0	45.85 13	60.30 315	5.736 35	38.57 130	5.407 57	83.39 267	34.588 38	65.23 53
	0	321	67	117	116	280	67	38
20.0	45.85	57.09	5.803	37.40	5.523	80.59	34.655	65.61
Mar. 2.0	46.00 15	53.93 316	5.902 99	36.41 99	5.695 172	77.70 289	34.752 97	65.78 17
11.9	46.29 23	50.97 206	6.035 133	35.68 73	5.925 230	74.79 291	34.882 130	65.74 4
21.9	46.71 42	48.32 265	6.201 166	35.24 44	6.210 285	71.92 287	35.044 162	65.44 30
31.9	47.24 53	46.08 224	6.400 199	35.15 9	6.545 335	69.15 277	35.236 192	64.86 58
	63	174	228	27	383	262	224	84
Apr. 10.9	47.87	44.34	6.628	35.42	6.928	66.53	35.460	64.02
20.8	48.60 73	43.16 118	6.886 258	36.06 64	7.352 424	64.11 242	35.710 250	62.89 113
30.8	49.37 77	42.58 58	7.165 279	37.05 99	7.813 461	61.96 215	35.984 274	61.53 136
May 10.8	50.18 81	42.63 5	7.464 299	38.38 133	8.302 489	60.11 185	36.276 292	59.94 159
20.8	51.00 82	43.29 66	7.773 309	40.03 165	8.809 507	58.61 150	36.582 306	58.18 176
	81	123	314	189	515	111	310	189
30.7	51.81	44.52	8.087	41.92	9.324	57.50	36.892	56.29
June 9.7	52.57 76	46.32 180	8.396 309	44.02 210	9.835 511	56.80 70	37.201 309	54.33 196
19.7	53.27 70	48.62 230	8.693 297	46.26 224	10.330 495	56.53 27	37.499 298	52.33 200
29.6	53.90 63	51.36 274	8.973 280	48.59 233	10.797 467	56.70 17	37.781 282	50.37 196
July 9.6	54.43 53	54.46 310	9.224 251	50.94 135	11.224 427	57.29 59	38.037 256	48.48 189
	43	339	219	233	375	101	225	177
19.6	54.86 30	57.85 360	9.443 182	53.27 224	11.599 314	58.30 137	38.262 189	46.71 160
29.6	55.16 20	61.45 373	9.625 141	55.51 211	11.913 244	59.67 172	38.451 148	45.11 142
Aug. 8.5	55.36 7	65.18 377	9.766 96	57.62 195	12.157 169	61.39 198	38.599 105	43.69 120
18.5	55.43 5	68.95 375	9.862 52	59.57 175	12.326 89	63.37 218	38.704 61	42.49 100
28.5	55.38 18	72.70 364	9.914 9	61.32 151	12.415 12	65.55 229	38.765 18	41.49 75
Sept. 7.5	55.20 30	76.34 345	9.923 31	62.83 128	12.427 64	67.84 231	38.783 21	40.74 55
17.4	54.90 39	79.79 280	9.892 65	64.11 103	12.363 133	70.15 224	38.762 57	40.19 34
27.4	54.51 48	82.99 258	9.827 95	65.14 77	12.230 194	72.39 208	38.705 87	39.85 13
Oct. 7.4	54.03 57	85.87 240	9.732 118	65.91 52	12.036 243	74.47 184	38.618 110	39.72 4
17.3	53.46 62	88.36 203	9.614 133	66.43 24	11.793 278	76.31 150	38.508 125	39.76 21
27.3	52.84 69	90.39 152	9.481 141	66.67 0	11.515 299	77.81 111	38.383 134	39.97 33
Nov. 6.3	52.15 70	91.91 97	9.340 143	66.67 26	11.216 305	78.92 68	38.249 134	40.30 46
16.3	51.45 72	92.88 39	9.197 137	66.41 59	10.911 297	79.60 20	38.115 130	40.76 56
26.2	50.73 70	93.27 22	9.060 126	65.92 73	10.614 276	79.80 28	37.985 118	41.32 64
Dec. 6.2	50.03 67	93.05 82	8.934 110	65.19 92	10.338 242	79.52 75	37.867 104	41.96 72
16.2	49.36 61	92.23 141	8.824 91	64.27 112	10.096 201	78.77 121	37.763 84	42.68 75
26.2	48.75 54	90.82 194	8.733 68	63.15 125	9.895 152	77.56 161	37.679 61	43.43 78
36.1	48.21	88.88	8.665	61.90	9.743	75.95	37.618	44.21
Mean Place	49.965	51.00	5.638	35.72	5.712	84.95	34.377	67.19
Sec δ, Tan δ	3.484	+3.337	1.025	+0.226	1.842	-1.547	1.000	-0.013
D _h α, D _m α	+0.01	-0.19	+0.06	-0.01	+0.08	+0.09	+0.06	0.00
D _h δ, D _m δ	+0.3	-0.5	+0.3	-0.5	+0.3	-0.5	+0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington on Time.	♈ Aquarii. Mag. 4.4		♐ Cephei. Mag. 5.4		♈ Grus. Mag. 2.2		♈ Pegasi. Mag. 4.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 2	° ' " -14 15	h m 22 2	° ' " +62 22	h m 22 3	° ' " -47 21	h m 22 3	° ' " +24 56
n. 1.1	0.859 ⁴⁴	64.06 ¹³	29.76 ²⁷	86.35 ²¹⁸	4.325 ⁹²	38.48 ¹⁴⁴	11.615 ⁷²	50.34 ¹⁶⁶
11.1	0.815 ¹⁵	64.19 ¹	29.49 ²¹	84.17 ²⁵⁸	4.233 ⁵⁰	37.04 ¹⁷⁷	11.543 ⁴⁴	48.68 ¹⁸²
21.1	0.800 ¹²	64.20 ¹³	29.28 ¹³	81.59 ²⁸⁵	4.183 ⁶	35.27 ²⁰²	11.499 ¹³	46.86 ¹⁹⁰
31.1	0.812 ⁴¹	64.07 ³⁰	29.15 ⁷	78.74 ³⁰⁵	4.177 ³⁹	33.25 ²²³	11.486 ²⁰	44.96 ¹⁹⁰
b. 10.0	0.853 ⁷²	63.77 ⁴⁶	29.08 ¹	75.69 ³⁰⁹	4.216 ⁸⁴	31.02 ²⁴¹	11.506 ⁵⁵	43.06 ¹⁸¹
20.0	0.925 ¹⁰³	63.31 ⁶⁶	29.09 ¹⁰	72.60 ³⁰²	4.300 ¹³⁰	28.61 ²⁵⁴	11.561 ⁹¹	41.25 ¹⁶⁴
ar. 2.0	1.028 ¹³³	62.65 ⁸⁴	29.19 ¹⁸	69.58 ²⁸³	4.430 ¹⁷⁵	26.07 ²⁶¹	11.652 ¹²⁹	39.61 ¹⁴⁰
11.9	1.161 ¹⁶⁷	61.81 ¹⁰⁴	29.37 ²⁶	66.76 ²⁵¹	4.605 ²¹⁸	23.46 ²⁶³	11.781 ¹⁶⁷	38.21 ¹⁰⁷
21.9	1.328 ¹⁹⁹	60.77 ¹²⁵	29.63 ³⁴	64.25 ²⁰⁹	4.823 ²⁶¹	20.83 ²⁵²	11.948 ²⁰⁴	37.14 ⁹⁹
31.9	1.527 ²²⁷	59.52 ¹⁴²	29.97 ⁴¹	62.16 ¹⁸⁰	5.084 ³⁰²	18.22 ²⁵²	12.152 ²³⁷	36.45 ²⁷
pr. 10.9	1.754 ²⁵⁷	58.10 ¹⁵⁹	30.38 ⁴⁶	60.56 ¹⁰⁵	5.386 ³³⁸	15.70 ²⁴²	12.389 ²⁶⁸	36.18 ¹⁷
20.8	2.011 ²⁸⁰	56.51 ¹⁷⁰	30.84 ⁵⁰	59.51 ⁴⁵	5.724 ³⁶⁸	13.28 ²²⁴	12.657 ²⁸⁴	36.35 ⁶¹
30.8	2.291 ³⁰⁰	54.81 ¹⁷⁹	31.34 ⁵³	59.06 ¹⁵	6.092 ³⁹⁵	11.04 ²⁰⁰	12.951 ³¹²	36.96 ¹⁰⁶
ay 10.8	2.591 ³¹³	53.02 ¹⁸³	31.87 ⁵⁵	59.21 ⁷⁵	6.487 ⁴¹²	9.04 ¹⁷⁴	13.263 ³²⁵	38.01 ¹⁴⁴
20.8	2.904 ³¹⁹	51.19 ¹⁸³	32.42 ⁵⁴	59.96 ¹³²	6.899 ⁴²⁰	7.30 ¹⁴³	13.588 ³²⁹	39.45 ¹⁸²
30.7	3.223 ³¹⁸	49.36 ¹⁷⁶	32.96 ⁵³	61.28 ¹⁸⁸	7.319 ⁴¹⁹	5.87 ¹⁰⁸	13.917 ³²⁵	41.27 ²¹³
ne 9.7	3.541 ³⁰⁸	47.60 ¹⁶⁷	33.49 ⁴⁹	63.14 ²³⁴	7.738 ⁴⁰⁷	4.79 ⁷⁰	14.242 ³¹²	43.40 ²³⁷
19.7	3.849 ²⁹³	45.93 ¹⁵³	33.98 ⁴⁵	65.48 ²⁷⁵	8.145 ³⁸⁶	4.09 ³²	14.554 ²⁹¹	45.77 ²⁵⁸
29.6	4.142 ²⁶⁶	44.40 ¹³⁵	34.43 ³⁹	68.23 ³¹⁰	8.531 ³⁵⁴	3.77 ⁸	14.845 ²⁶⁴	48.35 ²⁶⁸
ly 9.6	4.408 ²³⁶	43.05 ¹¹³	34.82 ³²	71.33 ³³⁶	8.885 ³¹²	3.85 ⁴⁶	15.109 ²³⁰	51.03 ²⁷⁵
19.6	4.644 ¹⁹⁸	41.92 ⁹¹	35.14 ²⁵	74.69 ³⁵⁵	9.197 ²⁶¹	4.31 ⁸³	15.339 ¹⁸⁹	53.78 ²⁷⁴
29.6	4.842 ¹⁵⁶	41.01 ⁶⁵	35.39 ¹⁸	78.24 ³⁶⁶	9.458 ²⁰⁶	5.14 ¹¹⁶	15.528 ¹⁴⁶	56.52 ²⁶⁷
ig. 8.5	4.998 ¹¹¹	40.36 ⁴²	35.57 ¹⁰	81.90 ³⁷⁰	9.664 ¹⁴³	6.30 ¹⁴⁴	15.674 ¹⁰⁰	59.19 ²⁵⁵
18.5	5.109 ⁶⁶	39.94 ¹⁷	35.67 ²	85.60 ³⁶⁵	9.807 ⁸¹	7.74 ¹⁶⁷	15.774 ⁵⁴	61.74 ²³⁹
28.5	5.175 ²¹	39.77 ³	35.69 ⁶	89.25 ³⁵²	9.888 ¹⁷	9.41 ¹⁸²	15.828 ⁹	64.13 ²¹⁹
pt. 7.5	5.196 ²¹	39.80 ²³	35.63 ¹³	92.77 ³³⁴	9.905 ⁴⁶	11.23 ¹⁸⁹	15.837 ³³	66.32 ¹⁹²
17.4	5.175 ⁵⁸	40.03 ³⁸	35.50 ²⁰	96.11 ³⁰⁷	9.859 ¹⁰⁰	13.12 ¹⁸⁹	15.804 ⁷⁰	68.24 ¹⁶⁶
27.4	5.117 ⁸⁹	40.41 ⁵⁰	35.30 ²⁶	99.18 ²⁷⁴	9.759 ¹⁴⁹	15.01 ¹⁸¹	15.734 ¹⁰¹	69.90 ¹³⁶
t. 7.4	5.028 ¹¹⁵	40.91 ⁵⁹	35.04 ³¹	101.92 ²³⁶	9.610 ¹⁸⁷	16.82 ¹⁰²	15.633 ¹²⁶	71.26 ¹⁰⁴
17.3	4.913 ¹³¹	41.50 ⁶³	34.73 ³⁴	104.28 ¹⁰¹	9.423 ²¹⁶	18.44 ¹⁴⁰	15.507 ¹⁴⁴	72.30 ⁷¹
27.3	4.782 ¹⁴⁰	42.13 ⁶⁴	34.39 ³⁸	106.19 ¹⁴⁰	9.207 ²³²	19.84 ¹⁰⁸	15.363 ¹⁵⁴	73.01 ³⁶
rv. 6.3	4.642 ¹⁴¹	42.77 ⁶²	34.01 ⁴⁰	107.59 ⁸⁸	8.975 ²³⁷	20.92 ⁷³	15.209 ¹⁵⁸	73.37 ²
16.3	4.501 ¹³⁶	43.39 ⁵⁸	33.61 ⁴⁰	108.47 ³¹	8.738 ²³¹	21.65 ³⁵	15.051 ¹⁵⁵	73.39 ³⁵
26.2	4.365 ¹²³	43.97 ⁵²	33.21 ³⁹	108.78 ²⁷	8.507 ²¹³	22.00 ⁶	14.896 ¹⁴⁶	73.04 ⁶⁸
c. 6.2	4.242 ¹⁰⁶	44.49 ⁴³	32.82 ³⁸	108.51 ⁸⁴	8.294 ¹⁹⁰	21.94 ⁴⁵	14.750 ¹³¹	72.36 ¹⁰⁰
16.2	4.136 ⁸⁷	44.92 ³⁵	32.44 ³⁴	107.67 ¹⁴²	8.104 ¹⁵⁷	21.49 ⁸⁵	14.619 ¹¹²	71.36 ¹³⁰
26.2	4.049 ⁶¹	45.27 ²¹	32.10 ³¹	106.25 ¹⁹¹	7.947 ¹²⁰	20.64 ¹²²	14.507 ⁹¹	70.06 ¹⁵⁶
36.1	3.988	45.48	31.79	104.34	7.827	19.42	14.416	68.50
Place	0.605	65.01	30.944	66.71	4.269	32.11	11.569	38.71
tan δ	1.032	-0.254	2.158	+1.912	1.476	-1.086	1.103	+0.465
D _α	+0.06	+0.01	+0.04	-0.11	+0.08	+0.06	+0.05	-0.03
D _δ	+0.3	-0.5	+0.3	-0.5	+0.3	-0.5	+0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pegasi. Mag. 3.7		π Pegasi. Mag. 4.4		ζ Cephei. Mag. 3.6		24 Cephei. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 6	° ' " + 5 47	h m 22 6	° ' " +32 46	h m 22 7	° ' " +57 47	h m 22 8	° ' " +71 56
Jan. 1.1	4.052 51	44.97 101	20.612 93	45.25 184	59.642 224	67.60 213	11.80 45	34.59 206
11.1	4.001 24	43.96 102	20.519 62	43.41 206	59.418 175	65.47 251	11.35 38	32.53 250
21.1	3.977 1	42.94 98	20.457 29	41.35 220	59.243 117	62.96 277	10.97 29	30.03 285
31.1	3.978 1	41.96 91	20.428 7	39.15 223	59.126 54	60.19 295	10.68 16	27.18 308
Feb. 10.0	4.009 60	41.05 75	20.435 45	36.92 219	59.072 14	57.24 300	10.52 3	24.10 319
20.0	4.069 91	40.30 58	20.480 87	34.73 202	59.086 87	54.24 293	10.49 9	20.91 316
Mar. 2.0	4.160 125	39.72 33	20.567 128	32.71 178	59.173 157	51.31 273	10.58 22	17.75 301
12.0	4.285 158	39.39 6	20.695 171	30.93 147	59.330 229	48.58 241	10.80 35	14.74 272
21.9	4.443 189	39.33 25	20.866 211	29.46 106	59.559 294	46.17 200	11.15 47	12.02 236
31.9	4.632 221	39.58 57	21.077 248	28.40 61	59.853 353	44.17 153	11.62 56	9.66 187
Apr. 10.9	4.853 250	40.15 87	21.325 281	27.79 14	60.206 404	42.64 97	12.18 64	7.79 134
20.8	5.103 273	41.02 119	21.606 310	27.65 35	60.610 444	41.67 40	12.82 71	6.45 75
30.8	5.376 292	42.21 145	21.916 329	28.00 84	61.054 471	41.27 19	13.53 75	5.70 14
May 10.8	5.668 306	43.66 171	22.245 342	28.84 130	61.525 485	41.46 78	14.28 77	5.56 48
20.8	5.974 312	45.37 189	22.587 347	30.14 173	62.010 487	42.24 134	15.05 76	6.04 107
30.7	6.286 309	47.26 203	22.934 341	31.87 210	62.497 473	43.58 187	15.81 74	7.11 162
June 9.7	6.595 299	49.29 213	23.275 327	33.97 240	62.970 449	45.45 232	16.55 69	8.73 215
19.7	6.894 284	51.42 215	23.602 305	36.37 267	63.419 411	47.77 274	17.24 62	10.88 259
29.7	7.178 257	53.57 212	23.907 276	39.04 284	63.830 364	50.51 306	17.86 55	13.47 299
July 9.6	7.435 227	55.69 205	24.183 237	41.88 295	64.194 308	53.57 331	18.41 44	16.46 329
19.6	7.662 192	57.74 193	24.420 196	44.83 300	64.502 245	56.88 351	18.85 35	19.75 354
29.6	7.854 150	59.67 177	24.616 150	47.83 297	64.747 177	60.39 360	19.20 24	23.29 369
Aug. 8.5	8.004 107	61.44 158	24.766 102	50.80 289	64.924 108	63.99 362	19.44 12	26.98 377
18.5	8.111 64	63.02 138	24.868 53	53.69 275	65.032 37	67.61 357	19.56 1	30.75 377
28.5	8.175 21	64.40 114	24.921 6	56.44 255	65.069 31	71.18 343	19.57 10	34.52 369
Sept. 7.5	8.196 18	65.54 93	24.927 39	58.99 233	65.038 97	74.61 326	19.47 20	38.21 353
17.4	8.178 54	66.47 67	24.888 78	61.32 202	64.941 155	77.87 298	19.27 31	41.74 331
27.4	8.124 84	67.14 46	24.810 111	63.34 173	64.786 208	80.85 265	18.96 40	45.05 300
Oct. 7.4	8.040 106	67.60 24	24.699 138	65.07 139	64.578 252	83.50 228	18.56 48	48.05 294
17.4	7.934 124	67.84 3	24.561 159	66.46 100	64.326 286	85.78 183	18.08 54	50.69 220
27.3	7.810 133	67.87 17	24.402 172	67.46 62	64.040 313	87.61 136	17.54 59	52.89 172
Nov. 6.3	7.677 134	67.70 35	24.230 176	68.08 21	63.727 327	88.97 84	16.95 63	54.61 117
16.3	7.543 131	67.35 52	24.054 175	68.29 21	63.400 333	89.81 28	16.32 64	55.78 59
26.2	7.412 120	66.83 67	23.879 166	68.08 61	63.067 328	90.09 27	15.68 64	56.37 1
Dec. 6.2	7.292 107	66.16 81	23.713 154	67.47 101	62.739 312	89.82 84	15.04 62	56.36 61
16.2	7.185 89	65.35 91	23.559 135	66.46 137	62.427 288	88.98 138	14.42 58	55.75 121
26.2	7.096 66	64.44 100	23.424 112	65.09 170	62.139 252	87.60 187	13.84 52	54.54 177
36.1	7.030	63.44	23.312	63.39	61.887	85.73	13.32	52.77
Mean Place	3.832	38.49	20.659	31.47	60.444	48.36	14.042	13.33
Sec δ , Tan δ	1.005	+0.102	1.189	+0.644	1.876	+1.588	3.226	+3.067
$D\psi\alpha$, $D_\omega\alpha$	+0.06	-0.01	+0.05	-0.04	+0.04	-0.09	+0.02	-0.18
$D\psi\delta$, $D_\omega\delta$	+0.3	-0.5	+0.3	-0.5	+0.4	-0.5	+0.4	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	θ Aquarii. Mag. 4.3		α Tucanæ. Mag. 2.9		γ Aquarii. Mag. 4.0		31 Pegasi. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 12	° ' " — 8 11	h m 22 12	° ' " — 60 39	h m 22 17	° ' " — 1 47	h m 22 17	° ' " +11 47
	s	"	s	"	s	"	s	"
a. 1.1	30.758	28.65 42	53.41	75.77	25.589	58.67	29.157	38.00
11.1	30.708	29.07 33	53.23	73.80	25.535	59.35 68	29.095	36.81 119
21.1	30.683	29.40 20	53.11	71.47	25.505	59.99 64	29.055	35.57 124
31.1	30.684	29.60 9	53.05	68.82	25.499	60.55 56	29.043	34.31 126
b. 10.0	30.713	29.69 12	53.05	65.95	25.522	60.99 28	29.059	33.12 119
20.0	30.772	29.57 30	53.13	62.90	25.572	61.27 10	29.104	32.02 110
ur. 2.0	30.861	29.27 50	53.27	59.76	25.655	61.37 13	29.183	31.11 91
12.0	30.982	28.77 73	53.46	56.58	25.769	61.24 36	29.295	30.43 68
21.9	31.136	28.04 96	53.72	53.43	25.916	60.88 65	29.442	30.03 40
31.9	31.321	27.08 119	54.05	50.39	26.096	60.23 90	29.623	29.96 27
ur. 10.9	31.538	25.89 140	54.42	47.49	26.307	59.33 117	29.837	30.23 63
20.8	31.784	24.49 158	54.84	44.81	26.548	58.16 139	30.081	30.86 96
30.8	32.054	22.91 173	55.31	42.39	26.815	56.77 162	30.351	31.82 131
uy 10.8	32.345	21.18 183	55.82	40.30	27.102	55.15 178	30.642	33.13 160
20.8	32.652	19.35 189	56.35	38.58	27.406	53.37 190	30.949	34.73 184
30.7	32.966	17.46 190	56.89	37.27	27.716	51.47 197	31.262	36.57 206
ne 9.7	33.280	15.56 185	57.43	36.40	28.028	49.50 199	31.576	38.63 219
19.7	33.585	13.71 177	57.96	35.98	28.332	47.51 196	31.880	40.82 228
29.7	33.876	11.94 161	58.46	36.03	28.621	45.55 187	32.169	43.10 231
ly 9.6	34.143	10.33 146	58.93	36.54	28.887	43.68 175	32.435	45.41 229
19.6	34.381	8.87 124	59.34	37.48	29.125	41.93 157	32.671	47.70 221
29.6	34.583	7.63 103	59.69	38.84	29.327	40.36 139	32.870	49.91 207
ig. 8.5	34.745	6.60 79	59.96	40.56	29.490	38.97 118	33.029	51.98 192
18.5	34.863	5.81 56	60.16	42.58	29.610	37.79 94	33.145	53.90 172
28.5	34.937	5.25 32	60.25	44.82	29.687	36.85 71	33.218	55.62 150
pt. 7.5	34.968	4.93 13	60.28	47.19	29.721	36.14 49	33.248	57.12 126
17.4	34.958	4.80 7	60.22	49.60	29.715	35.65 28	33.238	58.38 103
27.4	34.911	4.87 24	60.07	51.97	29.673	35.37 8	33.193	59.41 77
t. 7.4	34.832	5.11 36	59.86	54.17	29.600	35.29 8	33.116	60.18 52
17.4	34.729	5.47 46	59.58	56.14	29.502	35.37 25	33.014	60.70 27
27.3	34.608	5.93 53	59.27	57.77	29.385	35.62 37	32.894	60.97 3
v. 6.3	34.477	6.46 58	58.92	59.00	29.259	35.99 48	32.763	61.00 22
16.3	34.343	7.04 60	58.56	59.76	29.128	36.47 56	32.628	60.78 43
26.2	34.212	7.64 59	58.21	60.03	29.000	37.03 64	32.494	60.35 65
c. 6.2	34.092	8.23 58	57.87	59.79	28.881	37.67 68	32.368	59.70 84
16.2	33.985	8.81 54	57.56	59.04	28.774	38.35 72	32.254	58.86 100
26.2	33.896	9.35 48	57.30	57.80	28.683	39.07 72	32.156	57.86 114
36.1	33.829	9.83	57.08	56.10	28.613	39.79	32.076	56.72
Place	30.462	31.27	53.628	67.19	25.284	63.14	28.913	29.58
h, Tan δ	1.010	-0.144	2.041	-1.780	1.000	-0.031	1.022	+0.209
D_{α}	+0.06	+0.01	+0.08	+0.11	+0.06	0.00	+0.06	-0.01
D_{δ}	+0.4	-0.5	+0.4	-0.5	+0.4	-0.4	+0.4	-0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	3 Lacertæ. Mag. 4.6		π Aquarii. Mag. 4.6		σ Aquarii. Mag. 4.9		α Lacertæ. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 20	° ' " +51 48	h m 22 21	° ' " + 0 57	h m 22 26	° ' " -11 5	h m 22 27	° ' " +49 51
Jan. 1.2	19.595 ¹⁸⁶	83.15 ¹⁹⁸	5.669 ⁵⁸	44.22 ⁷⁹	18.928 ⁵⁹	50.66 ³⁰	54.413 ¹⁷⁸	56.65 ¹⁸⁸
11.1	19.409 ¹⁴⁸	81.17 ²³⁴	5.611 ³⁴	43.43 ⁷⁶	18.869 ³⁷	50.96 ¹⁷	54.235 ¹⁴⁴	54.77 ²³⁶
21.1	19.261 ¹⁰¹	78.83 ²⁶³	5.577 ¹⁰	42.67 ⁶⁹	18.832 ¹¹	51.13 ⁴	54.091 ¹⁰²	52.51 ²⁵³
31.1	19.160 ⁴⁹	76.20 ²⁷⁸	5.567 ¹⁹	41.98 ⁶⁰	18.821 ¹⁷	51.17 ¹²	53.989 ⁵⁴	49.98 ²⁶⁹
Feb. 10.0	19.111 ⁶	73.42 ²⁸³	5.586 ⁴⁶	41.38 ⁴⁵	18.838 ⁴⁴	51.05 ³⁰	53.935 ¹	47.29 ³⁷⁶
20.0	19.117	70.59	5.632	40.93	18.882	50.75	53.936	44.53
Mar. 2.0	19.183 ⁶⁶	67.82 ²⁷⁷	5.710 ⁷⁸	40.67 ²⁶	18.958 ⁷⁶	50.27 ⁴⁸	53.991 ⁵⁵	41.84 ²⁶⁹
12.0	19.309 ¹²⁶	65.25 ²⁵⁷	5.820 ¹¹⁰	40.63 ⁴	19.066 ¹⁰⁸	49.57 ⁷⁰	54.105 ¹¹⁴	39.32 ²³²
21.9	19.498 ¹⁸⁹	62.96 ²²⁹	5.962 ¹⁴²	40.85 ²²	19.206 ¹⁴⁰	48.65 ⁹²	54.278 ¹⁷³	37.09 ²²⁸
31.9	19.745 ²⁴⁷	61.06 ¹⁹⁰	6.139 ¹⁷⁷	41.34 ⁴⁹	19.380 ¹⁷⁴	47.51 ¹¹⁴	54.508 ²³⁰	35.21 ¹⁸⁸
Apr. 10.9	20.045 ³⁰⁰	59.62 ¹⁴⁴	6.347 ²⁰⁸	42.12 ⁷⁸	19.587 ²⁰⁷	46.18 ¹³³	54.791 ²⁸³	33.79 ¹²
20.9	20.392 ³⁴⁷	58.71 ⁹¹	6.584 ²³⁷	43.18 ¹⁰⁶	19.824 ²³⁷	44.66 ¹⁵²	55.121 ³³⁰	32.89 ⁹⁰
30.8	20.778 ³⁸⁶	58.35 ³⁶	6.849 ²⁶⁵	44.49 ¹³¹	20.089 ²⁶⁵	42.96 ¹⁷⁰	55.489 ³⁶⁸	32.52 ³⁷
May 10.8	21.191 ⁴¹³	58.56 ²¹	7.135 ²⁸⁶	46.04 ¹⁵⁵	20.375 ²⁸⁶	41.16 ¹⁸⁰	55.887 ³⁹⁸	32.71 ¹⁹
20.8	21.621 ⁴³⁶	59.33 ⁷⁷	7.437 ³⁰²	47.78 ¹⁷⁴	20.680 ³⁰⁵	39.27 ¹⁸⁹	56.303 ⁴¹⁶	33.45 ⁷⁴
30.7	22.057 ⁴³⁶	60.64 ¹³¹	7.746 ³⁰⁹	49.68 ¹⁹⁰	20.994 ³¹⁴	37.34 ¹⁹³	56.726 ⁴²³	34.72 ¹²⁷
June 9.7	22.487 ⁴³⁰	62.45 ¹⁸¹	8.057 ³¹¹	51.67 ¹⁹⁹	21.311 ³¹⁷	35.44 ¹⁹⁰	57.146 ⁴²⁰	36.49 ¹⁷⁷
19.7	22.899 ⁴¹²	64.70 ²²⁵	8.361 ³⁰⁴	53.71 ²⁰⁴	21.623 ³¹²	33.61 ¹⁸³	57.550 ⁴⁰⁴	38.70 ²²¹
29.7	23.281 ³⁸²	67.35 ²⁶⁵	8.651 ²⁹⁰	55.74 ²⁰³	21.920 ²⁹⁷	31.90 ¹⁷¹	57.930 ³⁸⁰	41.29 ²⁵⁹
July 9.6	23.625 ³⁴⁴	70.31 ²⁹⁶	8.918 ²⁶⁷	57.71 ¹⁹⁷	22.198 ²⁷⁸	30.34 ¹⁵⁶	58.275 ³⁴⁵	44.18 ²⁶⁹
19.6	23.923 ²⁹⁸	73.51 ³²⁰	9.157 ²³⁹	59.58 ¹⁸⁷	22.447 ²⁴⁹	28.97 ¹³⁷	58.575 ³⁰⁰	47.34 ³¹⁶
29.6	24.168 ²⁴⁵	76.88 ³³⁷	9.360 ²⁰³	61.31 ¹⁷³	22.661 ²¹⁴	27.83 ¹¹⁴	58.825 ²⁵⁰	50.65 ³²¹
Aug. 8.6	24.354 ¹⁸⁶	80.34 ³⁴⁶	9.525 ¹⁶⁵	62.84 ¹⁵³	22.836 ¹⁷⁵	26.93 ⁹⁰	59.020 ¹⁹⁵	54.06 ³⁴¹
18.5	24.481 ¹²⁷	83.83 ³⁴⁹	9.648 ¹²³	64.17 ¹³³	22.969 ¹³³	26.29 ⁶⁴	59.156 ¹³⁶	57.50 ³⁴⁴
28.5	24.545 ⁶⁴	87.26 ³⁴³	9.728 ⁸⁰	65.27 ¹¹⁰	23.058 ⁸⁹	25.88 ⁴¹	59.234 ⁷⁸	60.88 ³³⁸
Sept. 7.5	24.550 ⁵	90.56 ³³⁰	9.765 ³⁷	66.16 ⁸⁹	23.104 ⁴⁶	25.72 ¹⁶	59.254 ²⁰	64.15 ³²⁷
17.4	24.496 ⁵⁴	93.68 ³¹²	9.763 ²	66.81 ⁶⁵	23.107 ³	25.77 ⁵	59.219 ³⁵	67.23 ³⁰⁸
27.4	24.390 ¹⁰⁶	96.54 ²⁸⁶	9.723 ⁴⁰	67.24 ⁴³	23.071 ³⁶	26.02 ²⁵	59.132 ⁸⁷	70.07 ²⁸⁴
Oct. 7.4	24.237 ¹⁵³	99.09 ²⁵⁵	9.652 ⁷¹	67.46 ²²	23.002 ⁶⁹	26.41 ³⁹	59.000 ¹³²	72.60 ²⁵³
17.4	24.047 ¹⁹⁰	101.28 ²¹⁹	9.557 ⁹⁵	67.49 ³	22.908 ⁹⁴	26.92 ⁵¹	58.828 ¹⁷²	74.78 ²¹⁸
27.3	23.822 ²²⁵	103.05 ¹⁷⁷	9.442 ¹¹⁵	67.36 ¹³	22.793 ¹¹⁵	27.51 ⁵⁹	58.625 ²⁰³	76.56 ¹⁷⁸
Nov. 6.3	23.575 ²⁴⁷	104.37 ¹³²	9.317 ¹²⁵	67.06 ³⁰	22.666 ¹²⁷	28.15 ⁶⁴	58.400 ²²⁵	77.89 ¹³³
16.3	23.312 ²⁶³	105.18 ⁸¹	9.188 ¹²⁹	66.63 ⁴³	22.534 ¹³²	28.81 ⁶⁶	58.158 ²⁴²	78.75 ⁸⁶
26.3	23.045 ²⁶⁷	105.48 ³⁰	9.060 ¹²⁸	66.08 ⁵⁵	22.403 ⁵³	29.46 ⁶⁵	57.910 ²⁴⁸	79.09 ³⁴
Dec. 6.2	22.779 ²⁶⁶	105.25 ²³	8.940 ¹²⁰	65.44 ⁶⁴	22.279 ¹²⁴	30.07 ⁶¹	57.661 ²⁴⁹	78.92 ¹⁷
16.2	22.524 ²⁵⁵	104.49 ⁷⁶	8.832 ¹⁰⁸	64.72 ⁷²	22.168 ¹¹¹	30.62 ⁵⁵	57.421 ²⁴⁰	78.23 ⁶⁹
26.2	22.286 ²³⁸	103.21 ¹²⁸	8.739 ⁹³	63.95 ⁷⁷	22.072 ⁹⁶	31.09 ⁴⁷	57.197 ²²⁴	77.04 ¹¹⁹
36.1	22.079 ²⁰⁷	101.47 ¹⁷⁴	8.666 ⁷³	63.14 ⁸¹	21.996 ⁷⁶	31.48 ³⁹	56.997 ²⁰⁰	75.38 ¹⁶⁶
Mean Place	19.992	64.36	5.355	38.90	18.567	52.50	54.668	37.89
Sec δ, Tan δ	1.618	+1.272	1.000	+0.017	1.019	-0.196	1.551	+1.186
D _ψ α, D _ψ α	+0.05	-0.08	+0.06	0.00	+0.06	+0.01	+0.05	-0.07
D _ψ δ, D _ψ δ	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♈ Aquarii. Mag. 5.3			226 B. Cephei. Mag. 5.7			♎ Aquarii. Mag. 4.1			10 Lacertæ. Mag. 4.9		
	Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.	
	h m 22 30	° ' -21 7		h m 22 30	° ' +75 48		h m 22 31	° ' - 0 51		h m 22 35	° ' +38 37	
	s	"		s	"		s	"		s	"	
Jan. 1.2	12.957	44.69		47.79	36.60		8.954	80.80		34.864	39.60	
11.1	12.891	44.57	12	47.13	34.86	174	8.892	81.51	71	34.733	37.88	172
21.1	12.847	44.25	32	46.56	32.61	225	8.850	82.19	68	34.630	35.86	202
31.1	12.832	43.73	52	46.11	29.96	265	8.832	82.80	61	34.559	33.65	221
Feb. 10.1	12.845	43.01	72	45.81	27.02	294	8.840	83.30	50	34.525	31.32	233
			43			314			36			236
20.0	12.888	42.10		45.66	23.88		8.878	83.66		34.532	28.96	
Mar. 2.0	12.961	40.98	112	45.67	20.70	318	8.946	83.81	15	34.583	26.69	227
12.0	13.070	39.68	130	45.86	17.60	310	9.045	83.76	5	34.680	24.61	208
21.9	13.212	38.20	148	46.20	14.70	200	9.179	83.45	31	34.824	22.80	181
31.9	13.389	36.55	165	46.69	12.12	258	9.346	82.87	58	35.016	21.35	145
			177			216			84			102
Apr. 10.9	13.600	34.78		47.32	9.96		9.547	82.03		35.251	20.33	
20.9	13.843	32.88	190	48.08	8.30	166	9.778	80.91	112	35.528	19.77	56
30.8	14.114	30.91	197	48.92	7.19	111	10.038	79.55	136	35.840	19.72	5
May 10.8	14.410	28.91	200	49.83	6.68	51	10.320	77.96	159	36.178	20.16	44
20.8	14.724	26.93	198	50.78	6.76	8	10.620	76.20	176	36.537	21.12	96
			325			69			190			140
30.8	15.049	25.01		51.73	7.45		10.929	74.30		36.904	22.52	
June 9.7	15.379	23.20	181	52.66	8.72	127	11.242	72.31	199	37.271	24.36	184
19.7	15.705	21.57	163	53.55	10.53	181	11.548	70.29	202	37.628	26.57	221
29.7	16.017	20.13	144	54.36	12.83	230	11.843	68.28	201	37.967	29.10	253
July 9.6	16.309	18.94	119	55.08	15.56	273	12.117	66.35	193	38.278	31.88	278
			94			310			182			295
19.6	16.572	18.00		55.71	18.66		12.363	64.53		38.553	34.83	
29.6	16.800	17.36	64	56.21	22.04	338	12.575	62.88	165	38.788	37.91	308
Aug. 8.6	16.988	17.01	35	56.57	25.65	361	12.749	61.41	147	38.977	41.02	311
18.5	17.132	16.93	8	56.80	29.39	374	12.881	60.16	125	39.116	44.12	310
28.5	17.229	17.13	20	56.89	33.18	379	12.971	59.12	104	39.205	47.12	300
			43			378			79			286
Sept. 7.5	17.278	17.56		56.85	36.96		13.020	58.33		39.245	49.98	
17.4	17.285	18.20	64	56.66	40.64	368	13.027	57.76	57	39.236	52.64	266
27.4	17.250	18.99	79	56.35	44.14	350	12.997	57.40	36	39.186	55.06	242
Oct. 7.4	17.179	19.89	90	55.92	47.40	326	12.934	57.26	14	39.095	57.18	212
17.4	17.080	20.84	95	55.39	50.33	293	12.847	57.30	4	38.972	58.97	179
			96			254			21			143
27.3	16.957	21.80		54.75	52.87		12.740	57.51		38.824	60.40	101
Nov. 6.3	16.821	22.71	91	54.04	54.95	208	12.619	57.85	34	38.655	61.41	61
16.3	16.679	23.54	83	53.27	56.52	157	12.494	58.31	46	38.475	62.02	15
26.3	16.537	24.24	70	52.47	57.52	100	12.368	58.87	56	38.290	62.17	28
Dec. 6.2	16.402	24.80	56	51.65	57.91	39	12.249	59.50	63	38.104	61.89	72
			39			21			71			
16.2	16.281	25.19		50.83	57.70		12.138	60.21		37.926	61.17	
26.2	16.175	25.40	21	50.05	56.87	83	12.042	60.94	73	37.761	60.02	115
36.1	16.090	25.42	2	49.33	55.43	144	11.964	61.69	75	37.614	58.49	153
Mean Place	12.584	43.72		50.296	13.56		8.587	85.79		34.792	23.13	
Sec δ, Tan δ	1.072	-0.386		4.079	+3.955		1.000	-0.009		1.280	+0.799	
D _ψ α, D _ω α	+0.06	+0.02		+0.62	-0.24		+0.06	0.00		+0.05	-0.05	
D _ψ δ, D _ω δ	+0.4	-0.4		+0.4	-0.4		+0.4	-0.4		+0.4	-0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Piscis Australis. Mag. 4.2		ζ Pegasi. Mag. 3.6		β Gruis. Mag. 2.2		γ Pegasi. Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 36	° ' " -27 27	h m 22 37	° ' " +10 24	h m 22 37	° ' " -47 18	h m 22 39	° ' " +29 47
Jan. 1.2	7.751 ⁷⁸	81.50	22.676 ⁷²	18.83	46.869 ¹³²	57.48	9.596 ¹⁰⁶	45.04 ¹⁵⁵
11.1	7.673 ⁵⁵	81.12 ³⁸	22.604 ⁵⁴	17.76 ¹⁰⁷	46.737 ⁹⁷	56.25 ¹²³	9.490 ⁸¹	43.49 ¹⁷⁷
21.1	7.618 ²⁵	80.49 ⁶³	22.550 ²⁸	16.63 ¹¹³	46.640 ⁵⁶	54.66 ¹⁵⁹	9.409 ⁵⁵	41.72 ¹⁹²
31.1	7.593 ³	79.63 ⁸⁶	22.522 ³	15.49 ¹¹⁴	46.584 ¹⁵	52.77 ¹⁸⁹	9.354 ²³	39.80 ¹⁹⁹
Feb. 10.1	7.596 ³⁶	78.54 ¹⁰⁹	22.519 ²⁷	14.40 ¹⁰⁹	46.569 ²⁸	50.58 ²⁴¹	9.331 ¹¹	37.81 ¹⁹⁸
20.0	7.632 ⁷⁰	77.24 ¹⁵⁰	22.546 ⁵⁸	13.41 ⁸²	46.597 ⁷³	48.17 ²⁵⁹	9.342 ⁵⁰	35.83 ¹⁸⁷
Mar. 2.0	7.702 ¹⁰⁵	75.74 ¹⁶⁹	22.604 ⁹²	12.59 ⁵⁹	46.670 ¹¹⁹	45.58 ²⁷²	9.392 ⁹¹	33.96 ¹⁶⁷
12.0	7.807 ¹³⁹	74.05 ¹⁸⁴	22.696 ¹²⁸	12.00 ³³	46.789 ¹⁶⁵	42.86 ²⁷⁹	9.483 ¹³³	32.29 ¹⁴⁰
21.9	7.946 ¹⁷⁶	72.21 ¹⁹⁸	22.824 ¹⁶³	11.67 ³	46.954 ²¹²	40.07 ²⁸²	9.616 ¹⁷⁵	30.89 ¹⁰⁴
31.9	8.122 ²¹³	70.23 ²⁰⁸	22.987 ¹⁹⁸	11.64 ³⁰	47.166 ²⁵⁶	37.25 ²⁷⁹	9.791 ²¹⁶	29.83 ⁶⁵
Apr. 10.9	8.335 ²⁴⁶	68.15 ²¹⁴	23.185 ²³¹	11.94 ⁶⁵	47.422 ²⁹⁹	34.46 ²⁸⁹	10.007 ²⁵³	29.20 ²¹
20.9	8.581 ²⁷⁶	66.01 ²¹⁶	23.416 ²⁶⁰	12.59 ⁹⁶	47.721 ³³⁸	31.77 ²⁵⁵	10.260 ²⁸⁴	28.99 ²⁴
30.8	8.857 ³⁰³	63.85 ²¹⁴	23.676 ²⁸³	13.55 ¹²⁹	48.059 ³⁶⁸	29.22 ²³⁵	10.544 ³¹²	28.23 ⁷⁰
May 10.8	9.160 ³²²	61.71 ²⁰⁵	23.959 ³⁰²	14.84 ¹⁵⁸	48.427 ³⁹⁴	26.87 ²¹⁰	10.856 ³³⁰	29.93 ¹¹³
20.8	9.482 ³³⁷	59.66 ¹⁹³	24.261 ³¹³	16.42 ¹⁸¹	48.821 ⁴¹¹	24.77 ¹⁷⁹	11.186 ³⁴⁰	31.06 ¹⁵⁴
30.8	9.819 ³⁴¹	57.73 ¹⁷⁷	24.574 ³¹⁵	18.23 ²⁰⁰	49.232 ⁴¹⁷	22.98 ¹⁴⁵	11.526 ³⁴²	32.60 ¹⁸⁹
June 9.7	10.160 ³²⁸	55.96 ¹⁵³	24.889 ³¹¹	20.23 ²¹⁵	49.649 ⁴¹⁵	21.53 ¹⁰⁷	11.868 ³³⁶	34.49 ²²²
19.7	10.498 ³³⁷	54.43 ¹²⁸	25.200 ²⁹⁷	22.38 ²²³	50.064 ³⁹⁹	20.46 ⁶⁶	12.204 ³¹⁹	36.71 ²⁴⁵
29.7	10.825 ³⁰⁵	53.15 ⁹⁸	25.497 ²⁷⁷	24.61 ²²⁵	50.463 ³⁷⁶	19.80 ²⁴	12.523 ²⁸⁵	39.16 ²⁶⁶
July 9.6	11.130 ²⁷⁸	52.17 ⁶⁸	25.774 ²⁴⁸	26.86 ²²³	50.839 ³⁴¹	19.56 ¹⁸	12.818 ²⁶⁴	41.82 ²⁷⁶
19.6	11.408 ²⁴¹	51.49 ³⁵	26.022 ²¹⁶	29.09 ²¹³	51.180 ²⁹⁷	19.74 ⁵⁹	13.082 ²²⁶	44.58 ²⁸³
29.6	11.649 ²⁰¹	51.14 ⁵	26.238 ¹⁷⁷	31.22 ²⁰²	51.477 ²⁴⁵	20.33 ⁹⁷	13.308 ¹⁸⁴	47.41 ²⁸²
Aug. 8.6	11.850 ¹⁵⁴	51.09 ²³	26.415 ¹³⁶	33.24 ¹⁸⁶	51.722 ¹⁸⁷	21.30 ¹³¹	13.492 ¹⁴¹	50.23 ²⁷⁶
18.5	12.004 ¹⁰⁶	51.37 ⁵⁴	26.551 ⁹⁴	35.10 ¹⁶⁵	51.909 ¹²⁶	22.61 ¹⁶¹	13.633 ⁹³	52.99 ²⁶³
28.5	12.110 ⁵⁷	51.91 ⁷⁹	26.645 ⁵¹	36.75 ¹⁴⁵	52.035 ⁶³	24.22 ¹⁸²	13.726 ⁴⁸	55.62 ²⁴⁸
Sept. 7.5	12.167 ¹⁰	52.70 ⁹⁹	26.696 ¹¹	38.20 ¹²¹	52.098 ¹	26.04 ¹⁹⁷	13.774 ⁴	58.10 ²⁸⁶
17.5	12.177 ³⁴	53.69 ¹¹³	26.707 ²⁶	39.41 ⁹⁸	52.099 ⁵⁷	28.01 ²⁰³	13.778 ³⁷	60.36 ²⁰¹
27.4	12.143 ⁷²	54.82 ¹²¹	26.681 ⁵⁹	40.39 ⁷²	52.042 ¹¹⁰	30.04 ²⁰¹	13.741 ⁷²	62.37 ¹⁷²
Oct. 7.4	12.071 ¹⁰³	56.03 ¹²²	26.622 ⁸⁴	41.11 ⁵⁰	51.932 ¹⁵⁴	32.05 ¹⁸⁹	13.669 ¹⁰⁰	64.09 ¹⁴³
17.4	11.968 ¹²⁹	57.25 ¹¹⁸	26.538 ¹⁰⁴	41.61 ²⁵	51.778 ¹⁸⁸	33.94 ¹⁶⁹	13.569 ¹²⁶	65.52 ¹⁰⁸
27.3	11.839 ¹⁴⁵	58.43 ¹⁰⁸	26.434 ¹²⁰	41.86 ³	51.590 ²¹⁴	35.63 ¹⁴³	13.443 ¹⁴¹	66.60 ⁷³
Nov. 6.3	11.694 ¹⁵³	59.51 ⁹⁴	26.314 ¹²⁶	41.89 ²⁰	51.376 ²³⁰	37.06 ¹⁰⁹	13.302 ¹⁵²	67.33 ³⁶
16.3	11.541 ¹⁵³	60.45 ⁷⁵	26.188 ¹²⁸	41.69 ³⁹	51.149 ²²⁷	38.15 ⁷¹	13.150 ¹⁵⁷	67.69 ⁰
26.3	11.388 ¹⁴⁸	61.20 ⁵⁴	26.060 ¹²⁴	41.30 ⁵⁹	50.919 ²²⁴	38.86 ²⁹	12.993 ¹⁵⁵	67.69 ³⁸
Dec. 6.2	11.240 ¹³⁵	61.74 ²⁹	25.936 ¹¹⁶	40.71 ⁷⁷	50.695 ²⁰⁶	39.15 ¹²	12.838 ¹⁴⁹	67.31 ⁷⁶
16.2	11.105 ¹¹⁷	62.03 ⁵	25.820 ¹⁰⁴	39.94 ⁹²	50.489 ¹⁸⁶	39.03 ⁵⁵	12.689 ¹³⁷	66.55 ¹¹⁰
26.2	10.988 ⁹⁸	62.08 ²¹	25.716 ⁸⁸	39.02 ¹⁰⁴	50.303 ¹⁵⁵	38.48 ⁹⁵	12.552 ¹²¹	65.45 ¹⁴⁰
36.2	10.890	61.87	25.628	37.98	50.148	37.53	12.431	64.05
Mean Place	7.368	78.80	22.317	10.41	46.634	50.23	9.375	30.83
Sec δ, Tan δ	1.127	-0.520	1.017	+0.184	1.475	-1.084	1.153	+0.572
$D\psi\alpha, D\omega\alpha$	+0.07	+0.03	+0.06	-0.01	+0.07	+0.07	+0.06	-0.04
$D\psi\delta, D\omega\delta$	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	λ Pegasi. Mag. 4.1		ϵ Gruis. Mag. 3.7		τ Aquarii. Mag. 4.2		μ Pegasi. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 42	° ' " +23 8	h m 22 43	° ' " -51 44	h m 22 45	° ' " -14 1	h m 22 46	° ' " +24 10
	s 94	" 139	s 160	" 136	s 73	" 19	s 97	" 138
a. 1.2	35.078	14.07	36.671	62.09	15.589	31.49	2.965	18.56
	11.1	34.984	36.511	60.73	15.516	31.68	2.868	17.18
	21.1	34.913	36.390	58.97	15.464	31.73	2.793	15.61
	31.1	34.864	36.311	56.88	15.436	31.62	2.742	13.93
b. 10.1	34.848	7.75	36.278	54.50	15.432	31.32	2.720	12.19
	14	164	15	262	26	50	11	168
	20.0	34.862	36.293	51.88	15.458	30.82	2.731	10.51
r. 2.0	34.910	4.58	36.357	49.08	15.514	30.14	2.775	8.94
	12.0	34.997	36.472	46.15	15.602	29.25	2.859	7.56
	21.9	35.123	36.638	43.16	15.724	28.13	2.982	6.46
	31.9	35.288	36.854	40.17	15.882	26.82	3.145	5.68
	204	34	206	295	190	150	201	41
r. 10.9	35.492	1.15	37.120	37.22	16.072	25.32	3.346	5.27
	20.9	35.731	37.433	34.39	16.297	23.63	3.583	5.26
	30.8	36.002	37.787	31.74	16.552	21.82	3.854	5.67
y. 10.8	36.299	2.56	38.178	29.31	16.831	19.90	4.151	6.50
	20.8	36.614	38.595	27.17	17.132	17.93	4.466	7.73
	327	163	437	180	314	199	323	150
	30.8	36.941	39.032	25.37	17.446	15.94	4.794	9.32
ae. 9.7	37.271	7.39	39.480	23.94	17.766	14.00	5.127	11.22
	19.7	37.596	39.924	22.92	18.083	12.15	5.454	13.39
	29.7	37.905	40.355	22.34	18.390	10.45	5.766	15.77
ly. 9.6	38.194	14.49	40.760	22.21	18.680	8.93	6.059	18.31
	259	261	370	31	263	131	263	261
	19.6	38.453	41.130	22.52	18.943	7.62	6.322	20.92
	29.6	38.677	41.453	23.27	19.175	6.57	6.550	23.55
g. 8.6	38.862	22.27	41.722	24.42	19.368	5.79	6.739	26.15
	18.5	39.004	42.070	25.92	19.520	5.27	6.885	28.66
	28.5	39.101	42.070	27.71	19.628	5.02	6.987	31.04
	53	214	73	202	64	0	57	219
pt. 7.5	39.154	29.21	42.143	29.73	19.692	5.02	7.044	33.23
	17.5	39.166	42.147	31.91	19.713	5.25	7.059	35.22
	27.4	39.139	42.088	34.13	19.695	5.66	7.035	36.96
t. 7.4	39.078	34.23	41.970	36.31	19.643	6.24	6.977	38.43
	17.4	38.989	41.802	38.35	19.560	6.93	6.890	39.60
	112	81	208	183	104	76	109	89
	27.3	38.877	41.594	40.18	19.456	7.69	6.781	40.49
v. 6.3	38.750	36.68	41.357	41.70	19.335	8.47	6.653	41.04
	16.3	38.612	41.101	42.86	19.207	9.24	6.516	41.27
	26.3	38.471	40.841	43.60	19.077	9.96	6.374	41.17
c. 6.2	38.331	36.28	40.586	43.90	18.950	10.61	6.233	40.76
	134	76	240	17	117	56	135	73
	16.2	38.197	40.346	43.73	18.833	11.17	6.098	40.03
	26.2	38.075	40.130	43.09	18.728	11.62	5.972	39.02
	36.2	37.967	39.943	42.02	18.639	11.92	5.862	37.74
Place	34.770	1.68	36.472	53.89	15.136	32.47	2.642	5.80
Tan δ	1.087	+0.427	1.615	-1.268	1.031	-0.250	1.096	+0.449
$D_{\alpha} \alpha$	+0.06	-0.03	+0.07	+0.08	+0.06	+0.02	+0.06	-0.03
$D_{\alpha} \delta$	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Cephei. Mag. 3.7		λ Aquarii. Mag. 3.8		ρ Indi. Mag. 6.1		δ Aquarii. Mag. 3.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 46	° ' " +65 46	h m 22 48	° ' " - 8 0	h m 22 48	° ' " -70 30	h m 22 50	° ' " -16 14
	s 44.67	" 30.49	s 20.709	" 55.78	s 57.72	" 54.61	s 18.469	" 85.70
Jan. 1.2	44.67 36	30.49 167	20.709 72	55.78 44	57.72 40	54.61 202	18.469 78	85.70 13
11.1	44.31 32	28.82 215	20.637 55	56.22 33	57.32 32	52.59 247	18.391 58	85.83 4
21.1	43.99 26	26.67 255	20.582 30	56.55 19	57.00 24	50.12 283	18.333 33	85.79 24
31.1	43.73 18	24.12 282	20.552 7	56.74 6	56.76 13	47.29 316	18.300 9	85.55 42
Feb. 10.1	43.55 9	21.30 301	20.545 22	56.80 12	56.63 5	44.13 337	18.291 20	85.13 62
20.0	43.46 0	18.29 306	20.567 50	56.68 33	56.58 5	40.76 354	18.311 50	84.51 83
Mar. 2.0	43.46 10	15.23 299	20.617 84	56.35 52	56.63 14	37.22 359	18.361 83	83.68 104
12.0	43.56 20	12.24 279	20.701 118	55.83 77	56.77 24	33.63 358	18.444 118	82.64 125
22.0	43.76 28	9.45 248	20.819 153	55.06 99	57.01 34	30.05 348	18.562 154	81.39 144
31.9	44.04 38	6.97 208	20.972 186	54.07 123	57.35 43	26.57 334	18.716 187	79.95 163
Apr. 10.9	44.42 45	4.91 159	21.158 220	52.84 144	57.78 50	23.23 309	18.908 222	78.32 178
20.9	44.87 52	3.32 104	21.378 250	51.40 163	58.28 58	20.14 282	19.125 254	76.54 191
30.8	45.39 56	2.28 47	21.628 275	49.77 178	58.86 64	17.32 246	19.379 279	74.63 198
May 10.8	45.95 60	1.81 12	21.903 296	47.99 190	59.50 69	14.86 205	19.658 302	72.65 203
20.8	46.55 62	1.93 71	22.199 310	46.09 197	60.19 72	12.81 159	19.960 315	70.62 201
30.8	47.17 60	2.64 127	22.509 316	44.12 199	60.91 74	11.22 112	20.275 322	68.61 185
June 9.7	47.77 58	3.91 180	22.825 313	42.13 194	61.65 78	10.10 60	20.597 321	66.66 183
19.7	48.35 56	5.71 228	23.138 303	40.19 187	62.38 72	9.50 8	20.918 311	64.83 167
29.7	48.91 50	7.99 269	23.441 286	38.32 173	63.10 68	9.42 44	21.229 294	63.16 146
July 9.7	49.41 45	10.68 305	23.727 260	36.59 154	63.78 61	9.86 96	21.523 269	61.70 122
19.6	49.86 37	13.73 331	23.987 229	35.05 135	64.39 54	10.82 142	21.792 237	60.48 98
29.6	50.23 30	17.04 353	24.216 192	33.70 111	64.93 44	12.24 185	22.029 199	59.50 67
Aug. 8.6	50.53 21	20.57 365	24.408 151	32.59 87	65.37 34	14.09 221	22.228 158	58.83 41
18.5	50.74 13	24.22 371	24.559 108	31.72 60	65.71 28	16.30 250	22.386 113	58.42 12
28.5	50.87 3	27.93 368	24.667 66	31.12 37	65.94 10	18.80 269	22.499 70	58.30 13
Sept. 7.5	50.90 4	31.61 356	24.733 24	30.75 13	66.04 3	21.49 277	22.569 26	58.43 31
17.5	50.86 12	35.17 340	24.757 14	30.62 7	66.01 14	24.26 277	22.595 14	58.79 54
27.4	50.74 20	38.57 315	24.743 47	30.69 27	65.87 26	27.03 263	22.581 49	59.33 71
Oct. 7.4	50.54 26	41.72 284	24.696 77	30.96 40	65.61 35	29.66 241	22.532 80	60.04 80
17.4	50.28 31	44.56 245	24.619 97	31.36 53	65.26 45	32.07 206	22.452 103	60.84 53
27.4	49.97 38	47.01 201	24.522 114	31.89 60	64.81 50	34.13 104	22.349 120	61.69 88
Nov. 6.3	49.59 40	49.02 151	24.408 122	32.49 64	64.31 54	35.77 114	22.229 128	62.57 83
16.3	49.19 43	50.53 95	24.286 125	33.13 66	63.77 57	36.91 60	22.101 132	63.40 77
26.3	48.76 44	51.48 39	24.161 122	33.80 67	63.20 56	37.51 1	21.969 129	64.17 66
Dec. 6.2	48.32 44	51.87 20	24.039 113	34.46 63	62.64 55	37.52 57	21.840 120	64.83 63
16.2	47.88 43	51.67 79	23.926 103	35.09 58	62.09 50	36.95 115	21.720 109	65.38 42
26.2	47.45 40	50.88 136	23.823 87	35.67 51	61.59 43	35.80 168	21.611 93	65.80 24
36.2	47.05 40	49.52 136	23.736 87	36.18 51	61.16 43	34.12 168	21.518 93	66.04 24
Mean Place	45.438	7.88	20.243	58.59	58.162	43.88	17.993	86.01
Sec δ , Tan δ	2.437	+2.222	1.010	-0.141	2.998	-2.825	1.041	-0.292
$D\phi\alpha$, $D\omega\alpha$	+0.04	-0.14	+0.06	+0.01	+0.08	+0.18	+0.06	+0.02
$D\phi\delta$, $D\omega\delta$	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	α Piscis Australis. (Fomalhaut.) Mag. 1.3		\circ Andromedæ. Mag. 3.6		β Pegasi. Var. 2.2-2.7		α Pegasi. (Markab.) Mag. 2.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° '	h m	° '	h m	° '	h m	° '
	22 53	-30 2	22 58	+41 53	22 59	+27 38	23 0	+14 45
	s	"	s	"	s	"	s	"
a. 1.2	7.824	89.54	8.881	24.11	48.200	29.88	40.964	59.93
11.1	7.728	89.14	8.726	22.55	48.090	28.52	40.873	58.83
21.1	7.656	88.45	8.593	20.67	47.998	26.92	40.801	57.61
31.1	7.610	87.50	8.491	18.51	47.930	25.19	40.749	56.35
b. 10.1	7.594	86.29	8.425	16.19	47.890	23.37	40.722	55.10
20.0	7.610	84.86	8.399	13.79	47.883	21.55	40.723	53.93
r. 2.0	7.658	83.19	8.420	11.42	47.912	19.83	40.757	52.88
12.0	7.743	81.35	8.489	9.19	47.980	18.27	40.825	52.02
22.0	7.866	79.33	8.610	7.19	48.090	16.97	40.930	51.43
31.9	8.027	77.18	8.783	5.50	48.243	15.97	41.072	51.14
r. 10.9	8.226	74.93	9.005	4.22	48.437	15.34	41.253	51.16
20.9	8.461	72.63	9.273	3.38	48.670	15.13	41.470	51.54
30.8	8.731	70.31	9.581	3.02	48.938	15.33	41.720	52.28
y 10.8	9.030	68.04	9.923	3.17	49.236	15.97	41.997	53.36
20.8	9.352	65.86	10.287	3.83	49.556	17.03	42.296	54.75
30.8	9.690	63.83	10.667	4.97	49.890	18.47	42.610	56.43
ne 9.7	10.037	61.99	11.052	6.57	50.230	20.27	42.930	58.35
19.7	10.384	60.40	11.431	8.58	50.567	22.37	43.248	60.46
29.7	10.722	59.09	11.795	10.93	50.893	24.70	43.556	62.70
ly 9.7	11.043	58.09	12.133	13.58	51.198	27.23	43.848	65.01
19.6	11.336	57.43	12.438	16.46	51.476	29.88	44.113	67.34
29.6	11.595	57.12	12.704	19.51	51.719	32.59	44.348	69.63
g. 8.6	11.814	57.14	12.925	22.63	51.923	35.29	44.546	71.83
18.5	11.988	57.51	13.096	25.78	52.085	37.94	44.705	73.90
28.5	12.114	58.18	13.217	28.90	52.203	40.47	44.821	75.79
pt. 7.5	12.191	59.10	13.287	31.90	52.275	42.86	44.896	77.50
17.5	12.219	60.25	13.307	34.74	52.306	45.04	44.930	78.98
27.4	12.202	61.55	13.282	37.37	52.295	47.00	44.927	80.23
t. 7.4	12.144	62.93	13.214	39.73	52.249	48.68	44.889	81.23
17.4	12.052	64.34	13.109	41.78	52.172	50.09	44.822	81.97
27.4	11.931	65.71	12.975	43.49	52.070	51.18	44.733	82.47
v. 6.3	11.791	66.96	12.816	44.80	51.948	51.94	44.627	82.71
16.3	11.639	68.04	12.640	45.70	51.813	52.38	44.508	82.71
26.3	11.483	68.93	12.452	46.14	51.670	52.45	44.384	82.45
c. 6.2	11.330	69.56	12.259	46.14	51.525	52.17	44.259	81.98
16.2	11.185	69.92	12.067	45.67	51.382	51.56	44.137	81.29
26.2	11.054	70.01	11.883	44.75	51.246	50.63	44.024	80.41
36.2	10.942	69.80	11.712	43.41	51.123	49.39	43.922	79.37
Place	7.370	85.96	8.671	6.01	47.813	15.72	40.489	49.75
Tan δ	1.155	-0.579	1.343	+0.897	1.129	+0.524	1.034	+0.264
D_{α}	+0.06	+0.04	+0.05	-0.06	+0.06	-0.03	+0.06	-0.02
D_{δ}	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	55 Pegasi. Mag. 4.7		C ² Aquarii. Mag. 3.8		π Cephei. Mag. 4.6		ι Gruis. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 2	° ' " + 8 57	h m 23 5	° ' " -21 36	h m 23 5	° ' " +74 56	h m 23 5	° ' " -45 40
Jan. 1.2	52.873	66.72	5.119	65.47	15.79	63.16	43.737	96.74
11.2	52.787	65.76	5.027	65.45	15.11	61.83	43.585	94.81
21.1	52.719	64.76	4.955	65.18	14.51	59.96	43.462	93.48
31.1	52.670	63.76	4.904	64.70	14.00	57.61	43.371	91.78
Feb. 10.1	52.646	62.80	4.880	63.98	13.61	54.89	43.317	89.77
20.0	52.648	61.94	4.882	63.05	13.37	51.91	43.304	87.50
Mar. 2.0	52.681	61.25	4.917	61.88	13.26	48.79	43.334	84.99
12.0	52.748	60.74	4.986	60.51	13.31	45.66	43.408	82.31
22.0	52.850	60.49	5.089	58.93	13.52	42.65	43.527	79.50
31.9	52.988	60.51	5.229	57.17	13.89	39.88	43.693	76.63
Apr. 10.9	53.164	60.85	5.407	55.26	14.39	37.45	43.906	73.75
20.9	53.375	61.51	5.621	53.22	15.03	35.47	44.164	70.90
30.9	53.619	62.47	5.869	51.09	15.77	33.98	44.463	68.16
May 10.8	53.889	63.74	6.145	48.93	16.59	33.06	44.799	65.59
20.8	54.181	65.28	6.446	46.77	17.47	32.72	45.165	63.23
30.8	54.490	67.04	6.764	44.68	18.38	32.97	45.553	61.16
June 9.7	54.805	68.99	7.092	42.70	19.29	33.81	45.955	59.41
19.7	55.119	71.09	7.422	40.87	20.18	35.21	46.359	58.01
29.7	55.424	73.26	7.745	39.27	21.03	37.13	46.756	57.03
July 9.7	55.713	75.45	8.052	37.90	21.80	39.52	47.137	56.47
19.6	55.978	77.61	8.337	36.83	22.50	42.31	47.488	56.35
29.6	56.213	79.68	8.589	36.06	23.09	45.46	47.802	56.65
Aug. 8.6	56.412	81.63	8.806	35.59	23.58	48.88	48.071	57.37
18.6	56.572	83.42	8.981	35.45	23.94	52.50	48.288	58.48
28.5	56.691	85.01	9.113	35.62	24.18	56.24	48.447	59.92
Sept. 7.5	56.769	86.39	9.198	36.04	24.28	60.03	48.547	61.65
17.5	56.806	87.53	9.239	36.72	24.25	63.79	48.586	63.57
27.4	56.807	88.45	9.239	37.58	24.11	67.44	48.568	65.61
Oct. 7.4	56.772	89.12	9.200	38.58	23.83	70.90	48.497	67.70
17.4	56.709	89.57	9.128	39.67	23.45	74.11	48.379	69.73
27.4	56.625	89.79	9.030	40.79	22.98	76.97	48.222	71.61
Nov. 6.3	56.523	89.81	8.913	41.88	22.41	79.42	48.037	73.27
16.3	56.409	89.61	8.783	42.90	21.78	81.40	47.833	74.64
26.3	56.289	89.24	8.648	43.79	21.08	82.83	47.617	75.65
Dec. 6.3	56.168	88.70	8.512	44.52	20.35	83.70	47.401	76.26
16.2	56.053	88.00	8.382	45.07	19.59	83.95	47.194	76.46
26.2	55.944	87.17	8.263	45.42	18.85	83.59	47.000	76.22
36.2	55.846	86.24	8.157	45.55	18.15	82.60	46.828	75.55
Mean Place	52.363	58.88	4.578	64.13	17.134	38.52	43.328	88.24
Sec δ, Tan δ	1.012	+0.158	1.076	-0.396	3.851	+3.719	1.432	-1.024
$D\psi a, D\omega a$	+0.06	-0.01	+0.06	+0.03	+0.04	-0.24	+0.07	+0.07
$D\psi \delta, D\omega \delta$	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	59 Pegasi. Mag. 5.2		5 H ¹ . Cassiopeia. Mag. 5.6		φ Aquarii. Mag. 4.4		ψ Aquarii. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 7	° ' " + 8 16	h m 23 9	° ' " +56 42	h m 23 10	° ' " - 6 29	h m 23 11	° ' " - 9 31
	s "	"	s "	"	s "	"	s "	"
a. 1.2	36.287	36.87	19.786	77.75	5.136	25.37	36.397	62.08
11.2	36.200	35.94	19.532	76.29	5.051	25.88	36.311	62.44
21.1	36.129	34.98	19.307	74.39	4.982	26.28	36.243	62.71
31.1	36.077	34.02	19.123	72.11	4.933	26.56	36.193	62.84
b. 10.1	36.050	33.10	18.989	69.53	4.906	26.71	36.166	62.81
20.0	36.047	32.29	18.912	66.79	4.905	26.67	36.165	62.59
r. 2.0	36.076	31.64	18.900	63.98	4.934	26.44	36.194	62.17
12.0	36.138	31.18	18.960	61.22	4.995	25.98	36.254	61.52
22.0	36.234	30.97	19.091	58.64	5.089	25.31	36.347	60.66
31.9	36.368	31.02	19.294	56.33	5.221	24.38	36.478	59.56
r. 10.9	36.540	31.39	19.565	54.39	5.387	23.22	36.645	58.24
20.9	36.747	32.07	19.901	52.91	5.591	21.83	36.847	56.72
30.9	36.986	33.05	20.291	51.92	5.826	20.24	37.081	55.01
y 10.8	37.254	34.34	20.725	51.49	6.089	18.50	37.346	53.15
20.8	37.544	35.89	21.192	51.60	6.377	16.62	37.633	51.19
30.8	37.851	37.65	21.680	52.27	6.680	14.64	37.939	49.17
ne 9.7	38.165	39.60	22.174	53.47	6.993	12.63	38.254	47.15
19.7	38.480	41.68	22.661	55.18	7.307	10.62	38.571	45.17
29.7	38.786	43.83	23.130	57.33	7.615	8.69	38.882	43.28
ly 9.7	39.077	46.01	23.567	59.89	7.906	6.89	39.178	41.54
19.6	39.344	48.14	23.963	62.77	8.179	5.24	39.453	39.99
29.6	39.583	50.19	24.310	65.93	8.422	3.77	39.698	38.65
g. 8.6	39.786	52.12	24.600	69.27	8.629	2.55	39.910	37.57
18.6	39.950	53.87	24.827	72.73	8.799	1.58	40.084	36.74
28.5	40.074	55.42	24.992	76.26	8.928	0.87	40.216	36.19
pt. 7.5	40.156	56.77	25.089	79.74	9.015	0.40	40.305	35.90
17.5	40.199	57.87	25.125	83.14	9.062	0.16	40.354	35.85
27.4	40.204	58.75	25.099	86.38	9.069	0.14	40.363	36.04
t. 7.4	40.174	59.39	25.016	89.38	9.043	0.35	40.337	36.40
17.4	40.116	59.81	24.881	92.10	8.986	0.73	40.281	36.92
27.4	40.035	60.00	24.702	94.47	8.907	1.23	40.199	37.56
v. 6.3	39.936	59.99	24.484	96.42	8.806	1.82	40.100	38.28
16.3	39.825	59.78	24.235	97.92	8.695	2.49	39.989	39.03
26.3	39.707	59.40	23.965	98.91	8.578	3.18	39.869	39.78
c. 6.3	39.587	58.86	23.681	99.37	8.459	3.88	39.749	40.49
16.2	39.472	58.16	23.391	99.28	8.342	4.57	39.634	41.16
26.2	39.363	57.36	23.105	98.65	8.236	5.22	39.525	41.76
36.2	39.264	56.46	22.883	97.49	8.138	5.81	39.427	42.25
Place	35.748	28.70	19.776	55.84	4.557	28.69	35.811	64.39
tan δ	1.011	+0.146	1.822	+1.523	1.006	-0.114	1.014	-0.168
D _α α	+0.06	-0.01	+0.05	-0.10	+0.06	+0.01	+0.06	+0.01
D _α δ	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Tucanae. Mag. 4.1		γ Piscium. Mag. 3.8		γ Sculptoris. Mag. 4.5		α Cephei. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 12	° ' -58 40	h m 23 12	° ' + 2 50	h m 23 14	° ' -32 58	h m 23 15	° ' +67 30
Jan. 1.2	39.321	79.09	55.425	9.00	24.477	48.93	14.76	69.79
11.2	39.072 ²⁴⁹	77.73 ¹³⁶	55.339 ⁸⁶	8.23 ⁷⁷	24.360 ¹¹⁷	48.53 ⁴⁰	14.32 ⁴⁴	68.49 ¹²⁰
21.1	38.864 ²⁰⁸	75.91 ¹⁸²	55.270 ⁶⁰	7.47 ⁷⁶	24.263 ⁹⁷	47.80 ⁷³	13.93 ³⁰	66.67 ¹²¹
31.1	38.701 ¹⁶³	73.68 ²²³	55.218 ⁵²	6.77 ⁷⁰	24.192 ⁷¹	46.78 ¹⁰²	13.60 ³³	64.40 ²²⁷
Feb. 10.1	38.590 ¹¹¹	71.10 ²⁵⁸	55.190 ²⁸	6.15 ⁶²	24.147 ⁴⁵	45.46 ¹³²	13.34 ²⁶	61.77 ²⁶⁵
20.1	38.535 ⁵⁵	68.24 ²⁸⁶	55.186 ⁴	5.65 ⁵⁰	24.134 ¹³	43.88 ¹⁵⁸	13.18 ¹⁶	58.89 ²⁸⁸
Mar. 2.0	38.538 ³	65.15 ³⁰⁹	55.212 ²⁶	5.32 ³³	24.156 ²²	42.06 ¹⁸²	13.10 ⁸	55.88 ³⁰¹
12.0	38.601 ⁶³	61.91 ³²⁴	55.270 ⁵⁸	5.20 ¹²	24.214 ⁵⁸	40.03 ²⁰³	13.13 ³	52.87 ³⁰¹
22.0	38.726 ¹²⁵	58.59 ³³²	55.362 ⁹²	5.32 ¹²	24.310 ⁹⁶	37.82 ²²¹	13.27 ¹⁴	49.97 ³⁰⁰
31.9	38.915 ¹⁸⁹	55.26 ³³³	55.492 ¹³⁰	5.69 ³⁷	24.448 ¹³⁸	35.48 ²³⁴	13.52 ²⁵	47.31 ³⁰⁸
Apr. 10.9	39.164 ²⁴⁹	51.97 ³²⁰	55.659 ¹⁶⁷	6.35 ⁶⁶	24.626 ¹⁷⁸	33.03 ²⁴⁵	13.86 ³⁴	44.98 ³²³
20.9	39.473 ³⁰⁹	48.80 ³¹⁷	55.860 ²⁰¹	7.28 ⁹³	24.845 ²¹⁹	30.53 ²⁵⁰	14.30 ⁴⁴	43.09 ¹⁸⁹
30.9	39.836 ³⁶³	45.83 ²⁹⁷	56.094 ²³⁴	8.49 ¹²¹	25.100 ²⁵⁵	28.03 ²⁵⁰	14.81 ⁵¹	41.71 ¹³⁸
May 10.8	40.247 ⁴¹¹	43.10 ²⁷³	56.358 ²⁶⁴	9.94 ¹⁴⁵	25.388 ²⁸⁸	25.58 ²⁴⁵	15.39 ⁵⁸	40.85 ⁸⁶
20.8	40.699 ⁴⁵²	40.68 ²⁴²	56.645 ²⁸⁷	11.62 ¹⁶⁸	25.705 ³¹⁷	23.24 ²³⁴	16.01 ⁶²	40.57 ²⁸
30.8	41.181 ⁴⁸²	38.63 ²⁰⁵	56.949 ³⁰⁴	13.47 ¹⁸⁵	26.042 ³³⁷	21.06 ²¹⁸	16.66 ⁶⁵	40.88 ³¹
June 9.8	41.681 ⁵⁰⁰	37.00 ¹⁶³	57.263 ³¹⁴	15.45 ¹⁹⁸	26.394 ³⁵²	19.09 ¹⁹⁷	17.32 ⁶⁶	41.75 ⁸⁷
19.7	42.189 ⁵⁰⁸	35.82 ¹¹⁸	57.578 ³¹⁵	17.50 ²⁰⁵	26.748 ³⁵⁴	17.39 ¹⁷⁰	17.97 ⁶⁵	43.18 ¹⁶³
29.7	42.690 ⁵⁰¹	35.11 ⁷¹	57.885 ³⁰⁷	19.58 ²⁰⁸	27.096 ³⁴⁸	15.99 ¹⁴⁰	18.59 ⁶²	45.11 ¹⁹³
July 9.7	43.169 ⁴⁷⁹	34.91 ²⁰	58.179 ²⁹⁴	21.63 ²⁰⁵	27.431 ³³⁵	14.94 ¹⁰⁵	19.18 ⁵⁰	47.49 ²³³
19.6	43.616 ⁴⁴⁷	35.20 ²⁹	58.452 ²⁷³	23.61 ¹⁹⁸	27.742 ³¹¹	14.26 ⁶⁸	19.70 ⁵²	50.26 ²⁷⁷
29.6	44.017 ⁴⁰¹	35.98 ⁷⁸	58.694 ²⁴²	25.46 ¹⁸⁵	28.022 ²⁸⁰	13.96 ³⁰	20.16 ⁴⁶	53.37 ³¹¹
Aug. 8.6	44.361 ³⁴⁴	37.21 ¹²³	58.903 ²⁰⁹	27.12 ¹⁶⁶	28.264 ²⁴²	13.96 ⁷	20.16 ³⁰	53.37 ³³⁷
18.6	44.638 ²⁷⁷	38.85 ¹⁶⁴	59.074 ¹⁷¹	28.60 ¹⁴⁸	28.462 ¹⁹⁸	14.03 ⁴³	20.55 ²⁰	56.74 ²⁵⁶
28.5	44.843 ²⁰⁵	40.84 ¹⁹⁹	59.205 ¹³¹	29.86 ¹²⁶	28.612 ¹⁵⁰	14.46 ⁷⁷	20.84 ²¹	60.30 ³⁶⁶
Sept. 7.5	44.968 ¹²⁵	43.12 ²²⁸	59.295 ⁹⁰	30.89 ¹⁰³	28.612 ¹⁰⁰	15.23 ¹⁰⁷	21.05 ¹²	63.96 ³⁷⁰
17.5	45.013 ⁴⁵	45.56 ²⁴⁴	59.344 ⁴⁹	31.67 ⁷⁸	28.712 ⁵¹	16.30 ¹²⁹	21.17 ⁴	67.66 ³⁶⁸
27.5	44.982 ³¹	48.10 ²⁵⁴	59.356 ¹²	32.23 ⁵⁶	28.763 ³	17.59 ¹⁴⁸	21.21 ⁶	71.32 ³⁵⁴
Oct. 7.4	44.876 ¹⁰⁶	50.63 ²⁵³	59.333 ²³	32.57 ³⁴	28.766 ³	19.07 ¹⁵⁹	21.15 ¹⁵	74.86 ³³⁸
17.4	44.705 ¹⁷¹	53.04 ²⁴¹	59.282 ⁵¹	32.69 ¹²	28.726 ⁴⁰	20.66 ¹⁵⁹	21.00 ²¹	78.22 ³⁰⁸
27.4	44.477 ²²⁸	55.22 ²¹⁸	59.206 ⁷⁶	32.69 ⁶	28.647 ⁷⁹	22.28 ¹⁶²	20.79 ²⁸	81.30 ²⁷⁵
Nov. 6.3	44.477 ²⁷²	55.22 ¹⁸⁹	59.206 ⁹³	32.63 ²⁴	28.537 ¹³⁴	23.86 ¹⁴⁷	20.51 ³⁴	84.05 ²³⁶
16.3	44.205 ³⁰⁴	57.11 ¹⁴⁸	59.113 ¹⁰⁶	32.39 ³⁸	28.403 ¹⁵⁰	25.33 ¹²⁹	20.17 ³⁹	86.41 ¹⁸⁹
26.3	43.901 ³²²	58.59 ¹⁴³	59.007 ¹¹³	32.01 ⁵⁰	28.253 ¹⁶¹	26.62 ¹⁰⁶	19.78 ⁴³	88.30 ¹³⁶
Dec. 6.3	43.579 ³²⁶	59.62 ⁵⁴	58.894 ¹¹⁵	31.51 ⁶⁰	28.094 ¹⁵⁹	27.68 ⁷⁸	19.35 ⁴⁶	89.66 ⁸¹
16.2	43.253 ³²⁰	60.16 ⁰	58.779 ¹¹²	30.91 ⁶⁹	27.933 ¹⁵⁷	28.46 ⁴⁸	18.89 ⁴⁷	90.47 ²²
26.2	42.933 ³⁰²	60.16 ⁵²	58.667 ¹⁰⁷	30.22 ⁷⁵	27.776 ¹⁴⁸	28.94 ¹⁵	18.42 ⁴⁸	90.69 ³⁷
36.2	42.631 ²⁷³	59.64 ¹⁰³	58.560 ⁹⁷	29.47 ⁷⁹	27.628 ¹³²	29.09 ¹⁷	17.94 ⁴⁵	90.32 ⁹⁸
36.2	42.358	58.61	58.463	28.68	27.496	28.92	17.49	89.34
Mean Place	39.069	69.08	54.841	2.59	23.923	44.30	15.123	45.75
Sec δ , Tan δ	1.924	-1.644	1.001	+0.050	1.192	-0.649	2.632	+2.434
$D\psi\alpha$, $D\omega\alpha$	+0.07	+0.11	+0.06	0.00	+0.06	+0.04	+0.05	-0.16
$D\psi\delta$, $D\omega\delta$	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington in Time.	τ Pegasi. Mag. 4.6		δ^1 Aquarii. Mag. 4.2		4 Cassiopeiae. Mag. 5.2		ν Pegasi. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 16	° ' " +23 17	h m 23 18	° ' " -20 32	h m 23 21	° ' " +61 49	h m 23 21	° ' " +22 57
n. 1.2	35.087	41.71	40.526	55.56	11.25	80.21	17.628	21.85
11.2	34.977	40.51	40.427	55.63	10.92	78.92	17.518	20.68
21.1	34.882	39.12	40.345	55.45	10.62	77.14	17.422	19.33
31.1	34.808	37.61	40.284	55.06	10.37	74.93	17.346	17.86
ob. 10.1	34.758	36.04	40.246	54.42	10.17	72.37	17.293	16.33
20.1	34.738	34.47	40.235	53.56	10.04	69.59	17.269	14.80
ar. 2.0	34.751	32.98	40.255	52.47	9.99	66.70	17.278	13.34
12.0	34.801	31.65	40.307	51.16	10.01	63.80	17.323	12.04
22.0	34.891	30.57	40.395	49.63	10.12	61.03	17.409	10.97
31.9	35.023	29.77	40.520	47.92	10.32	58.51	17.536	10.18
pr. 10.9	35.196	29.30	40.683	46.03	10.60	56.33	17.704	9.71
20.9	35.409	29.21	40.883	44.01	10.96	54.56	17.913	9.63
30.9	35.659	29.52	41.117	41.88	11.37	53.29	18.158	9.93
ay 10.8	35.938	30.22	41.384	39.70	11.84	52.54	18.434	10.62
20.8	36.244	31.30	41.675	37.51	12.36	52.36	18.738	11.68
30.8	36.566	32.72	41.987	35.37	12.90	52.74	19.058	13.09
ne 9.8	36.898	34.48	42.310	33.33	13.46	53.69	19.389	14.82
19.7	37.230	36.50	42.637	31.43	14.00	55.16	19.721	16.82
29.7	37.554	38.73	42.960	29.74	14.53	57.11	20.046	19.03
ly 9.7	37.861	41.12	43.270	28.28	15.03	59.48	20.355	21.38
19.6	38.145	43.61	43.560	27.10	15.48	62.24	20.641	23.85
29.6	38.396	46.14	43.820	26.22	15.88	65.32	20.897	26.35
ig. 8.6	38.613	48.64	44.045	25.66	16.22	68.62	21.118	28.84
18.6	38.789	51.08	44.232	25.42	16.48	72.10	21.299	31.26
28.5	38.923	53.40	44.376	25.49	16.68	75.67	21.440	33.56
pt. 7.5	39.016	55.56	44.475	25.85	16.80	79.26	21.537	35.69
17.5	39.066	57.53	44.530	26.46	16.86	82.79	21.593	37.64
27.5	39.076	59.26	44.543	27.28	16.83	86.20	21.609	39.36
t. 7.4	39.051	60.76	44.517	28.26	16.75	89.42	21.589	40.85
17.4	38.995	61.98	44.458	29.35	16.59	92.36	21.539	42.06
27.4	38.913	62.93	44.372	30.48	16.39	94.98	21.461	43.01
iv. 6.3	38.811	63.57	44.265	31.61	16.14	97.21	21.363	43.65
16.3	38.692	63.92	44.143	32.67	15.85	98.98	21.249	44.00
26.3	38.565	63.97	44.013	33.63	15.52	100.25	21.124	44.07
ic. 6.3	38.432	63.71	43.880	34.44	15.18	100.98	20.994	43.82
16.2	38.299	63.16	43.750	35.07	14.82	101.14	20.863	43.30
26.2	38.170	62.32	43.628	35.51	14.46	100.73	20.735	42.49
36.2	38.051	61.23	43.517	35.72	14.12	99.76	20.614	41.45
Place	34.552	28.54	39.914	54.44	11.244	56.94	17.058	8.72
l, Tan δ	1.089	+0.431	1.068	-0.375	2.118	+1.869	1.086	+0.424
$D_{\alpha} \alpha$	+0.06	-0.03	+0.06	+0.02	+0.05	-0.12	+0.06	-0.03
$D_{\alpha} \delta$	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Piscium. Mag. 4.9		θ Piscium. Mag. 4.4		70 Pegasi. Mag. 4.7		β Sculptoris. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 22	° ' " + 0 48	h m 23 23	° ' " + 5 55	h m 23 25	° ' " +12 18	h m 23 28	° ' " -38 15
Jan. 1.2	44.376	29.54	49.100	50.02	1.004	38.64	35.279	85.69
11.2	44.285	28.82	49.006	49.19	0.905	37.68	35.137	85.21
21.1	44.209	28.15	48.926	48.34	0.820	36.63	35.016	84.35
31.1	44.149	27.54	48.865	47.51	0.753	35.55	34.919	83.13
Feb. 10.1	44.109	27.02	48.823	46.75	0.707	34.48	34.852	81.59
20.1	44.096	26.64	48.807	46.10	0.687	33.48	34.816	79.76
Mar. 2.0	44.111	26.44	48.820	45.59	0.697	32.60	34.815	77.66
12.0	44.157	26.43	48.865	45.28	0.739	31.92	34.855	75.36
22.0	44.239	26.68	48.945	45.20	0.819	31.45	34.935	72.87
31.9	44.358	27.16	49.063	45.40	0.938	31.27	35.058	70.24
Apr. 10.9	44.514	27.92	49.219	45.86	1.096	31.39	35.226	67.53
20.9	44.706	28.95	49.410	46.63	1.292	31.82	35.437	64.80
30.9	44.933	30.24	49.637	47.69	1.522	32.59	35.690	62.08
May 10.8	45.189	31.75	49.895	49.01	1.784	33.68	35.979	59.46
20.8	45.471	33.47	50.177	50.59	2.071	35.06	36.299	56.97
30.8	45.772	35.35	50.479	52.37	2.377	36.71	36.644	54.67
June 9.8	46.083	37.33	50.790	54.30	2.694	38.57	37.006	52.64
19.7	46.398	39.38	51.105	56.35	3.013	40.61	37.376	50.91
29.7	46.706	41.43	51.414	58.46	3.327	42.77	37.743	49.53
July 9.7	47.002	43.44	51.711	60.56	3.627	44.98	38.098	48.53
19.6	47.278	45.35	51.987	62.61	3.906	47.21	38.433	47.94
29.6	47.527	47.10	52.235	64.57	4.157	49.38	38.737	47.76
Aug. 8.6	47.742	48.69	52.451	66.39	4.375	51.46	39.003	48.00
18.6	47.920	50.07	52.629	68.02	4.555	53.41	39.224	48.63
28.5	48.060	51.22	52.769	69.46	4.697	55.18	39.397	49.62
Sept. 7.5	48.158	52.13	52.867	70.66	4.797	56.75	39.518	50.94
17.5	48.216	52.79	52.926	71.64	4.857	58.11	39.585	52.51
27.5	48.236	53.23	52.947	72.37	4.878	59.22	39.602	54.26
Oct. 7.4	48.222	53.43	52.934	72.89	4.866	60.11	39.571	56.13
17.4	48.177	53.44	52.891	73.17	4.824	60.75	39.497	58.02
27.4	48.109	53.27	52.822	73.26	4.756	61.17	39.387	59.86
Nov. 6.3	48.021	52.95	52.735	73.16	4.668	61.35	39.249	61.55
16.3	47.920	52.51	52.634	72.89	4.566	61.32	39.089	63.04
26.3	47.810	51.95	52.524	72.47	4.454	61.07	38.916	64.25
Dec. 6.3	47.696	51.32	52.409	71.91	4.336	60.63	38.738	65.15
16.2	47.582	50.62	52.294	71.24	4.219	60.01	38.561	65.67
26.2	47.473	49.89	52.184	70.48	4.104	59.23	38.393	65.82
36.2	47.372	49.15	52.080	69.65	3.996	58.31	38.237	65.59
Mean Place	43.734	23.75	48.460	42.50	0.371	28.95	34.680	79.54
Sec δ , Tan δ	1.000	+0.014	1.005	+0.104	1.024	+0.218	1.273	-0.789
$D\psi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.06	-0.01	+0.06	-0.01	+0.06	+0.05
$D\psi\delta$, $D\omega\delta$	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2	+0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	72 Pegasi (mean.) Mag. 5.2			λ Andromedæ. Mag. 4.0			ι Andromedæ. Mag. 4.3			ι Piscium. Mag. 4.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "
	23	29	+30 52	23	33	+46 0	23	34	+42 48	23	35	+ 5 10
	s		"	s		"	s		"	s		"
Jan. 1.2	53.490		37.46	33.255		69.79	7.138		69.76	44.622		61.61
11.2	53.359	131	36.25	33.064	191	68.55	6.963	175	68.53	44.525	97	60.80
21.1	53.242	117	34.80	32.890	174	66.92	6.803	160	66.94	44.439	86	59.98
31.1	53.144	98	33.13	32.741	149	64.97	6.666	137	65.04	44.370	69	59.19
Feb. 10.1	53.072	72	31.33	32.625	116	62.75	6.559	107	62.91	44.320	50	58.48
		42	185		77	237		69	227		27	62
20.1	53.030		29.48	32.548		60.38	6.490		60.64	44.293		57.86
Mar. 2.0	53.024	6	27.66	32.518	30	57.95	6.464	26	58.33	44.294	1	57.39
12.0	53.058	34	25.96	32.540	22	55.56	6.487	23	56.07	44.328	34	57.13
22.0	53.136	78	24.45	32.618	78	53.32	6.563	76	53.99	44.398	70	57.08
Apr. 1.0	53.258	122	23.22	32.754	136	51.34	6.693	130	52.15	44.505	107	57.30
		169	92		192	166		184	151		145	48
10.9	53.427		22.30	32.946		49.68	6.877		50.64	44.650		57.78
20.9	53.639	212	21.78	33.192	246	48.43	7.114	237	49.54	44.833	183	58.56
30.9	53.891	252	21.68	33.487	295	47.63	7.395	281	48.87	45.052	219	59.63
May 10.8	54.178	287	22.00	33.824	337	47.30	7.718	323	48.68	45.304	252	60.95
20.8	54.494	316	22.74	34.194	370	47.48	8.074	356	48.98	45.581	277	62.52
		335	115		395	68		377	78		299	176
30.8	54.829		23.89	34.589		48.16	8.451		49.76	45.880		64.27
June 9.8	55.177	348	25.43	34.996	407	49.32	8.841	390	51.01	46.191	311	66.19
19.7	55.527	350	27.29	35.405	409	50.92	9.234	393	52.68	46.507	316	68.21
29.7	55.870	343	29.45	35.805	400	52.94	9.620	386	54.72	46.820	313	70.29
July 9.7	56.197	327	31.83	36.187	382	55.29	9.987	367	57.09	47.120	300	72.36
		304	256		353	265		339	265		284	202
19.7	56.501		34.39	36.540		57.94	10.326		59.74	47.404		74.38
29.6	56.774	273	37.05	36.856	316	60.81	10.632	306	62.58	47.660	256	76.30
Aug. 8.6	57.012	238	39.76	37.131	275	63.85	10.896	264	65.56	47.885	225	78.07
18.6	57.208	196	42.46	37.357	226	66.97	11.116	220	68.62	48.075	190	79.65
28.5	57.361	153	45.10	37.533	176	70.12	11.287	171	71.68	48.226	151	81.04
		109	251		125	312		122	301		112	114
Sept. 7.5	57.470		47.61	37.658		73.24	11.409		74.69	48.338		82.18
17.5	57.535	65	49.97	37.730	72	76.25	11.482	73	77.59	48.409	71	83.11
27.5	57.559	24	52.12	37.753	23	79.11	11.507	25	80.33	48.443	34	83.79
Oct. 7.4	57.545	14	54.04	37.730	23	81.75	11.488	59	82.84	48.443	0	84.25
17.4	57.497	48	56.69	37.664	66	84.14	11.429	19	85.10	48.412	31	84.48
		78	136		103	206		93	194		57	4
27.4	57.419		57.05	37.561		86.20	11.336		87.04	48.355		84.52
Nov. 6.4	57.318	101	58.08	37.427	134	87.91	11.212	124	88.62	48.277	78	84.39
16.3	57.197	121	58.78	37.266	161	89.21	11.064	148	89.83	48.184	93	84.08
26.3	57.063	134	59.13	37.085	181	90.09	10.896	168	90.61	48.080	104	83.63
Dec. 6.3	56.920	143	59.13	36.888	197	90.51	10.715	181	90.95	47.970	110	83.05
		147	37		204	6		188	10		113	67
16.2	56.773		58.76	36.684		90.45	10.527		90.85	47.857		82.38
26.2	56.627	146	58.05	36.478	206	89.92	10.337	190	90.29	47.747	110	81.63
36.2	56.486	141	57.01	36.276	202	88.93	10.151	186	89.30	47.641	106	80.82
Mean Place	52.900		21.72	32.758		49.71	6.603		50.48	43.910		54.27
Sec δ , Tan δ	1.165		+0.598	1.440		+1.036	1.364		+0.927	1.004		+0.091
$D\psi\alpha$, $D\omega\alpha$	+0.06		-0.04	+0.06		-0.07	+0.06		-0.06	+0.06		-0.01
$D\psi\delta$, $D\omega\delta$	+0.4		-0.1	+0.4		-0.1	+0.4		-0.1	+0.4		-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cephei. Mag. 3.4		κ Andromedæ. Mag. 4.3		ω^2 Aquarii. Mag. 4.6		δ^1 Aquarii. Mag. 5.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 35	° ' " +77 10	h m 23 36	° ' " +43 52	h m 23 38	° ' " -14 59	h m 23 39	° ' " -18 43
Jan. 1.2	57.58	54.81	22.429	66.64	28.982	53.35	57.739	56.65
11.2	56.73	53.93	22.247	65.43	28.880	53.65	57.632	56.85
21.2	55.95	52.46	22.083	63.85	28.789	53.76	57.537	56.82
31.1	55.26	50.46	21.940	61.96	28.716	53.68	57.461	56.56
Feb. 10.1	54.69	48.02	21.828	59.82	28.662	53.38	57.404	56.07
20.1	54.27	45.24	21.754	57.54	28.633	52.86	57.372	55.33
Mar. 2.0	54.02	42.23	21.724	55.20	28.632	52.11	57.368	54.37
12.0	53.94	39.11	21.744	52.91	28.662	51.13	57.397	53.16
22.0	54.06	36.04	21.817	50.78	28.728	49.93	57.461	51.74
Apr. 1.0	54.35	33.10	21.945	48.88	28.831	48.51	57.563	50.09
10.9	54.83	30.44	22.128	47.32	28.972	46.87	57.703	48.27
20.9	55.46	28.14	22.365	46.15	29.151	45.07	57.882	46.29
30.9	56.23	26.29	22.649	45.42	29.367	43.11	58.098	44.17
May 10.8	57.12	24.95	22.974	45.17	29.616	41.03	58.348	41.98
20.8	58.10	24.16	23.333	45.41	29.893	38.89	58.626	39.75
30.8	59.14	23.95	23.715	46.14	30.193	36.74	58.928	37.55
June 9.8	60.20	24.33	24.110	47.33	30.506	34.64	59.244	35.42
19.7	61.26	25.28	24.508	48.96	30.827	32.61	59.568	33.41
29.7	62.28	26.77	24.899	50.98	31.146	30.73	59.891	31.57
July 9.7	63.25	28.77	25.273	53.32	31.455	29.06	60.205	29.97
19.7	64.14	31.23	25.619	55.95	31.747	27.60	60.501	28.63
29.6	64.93	34.07	25.930	58.79	32.013	26.42	60.772	27.59
Aug. 8.6	65.60	37.26	26.201	61.78	32.248	25.52	61.012	26.86
18.6	66.15	40.71	26.426	64.86	32.446	24.94	61.214	26.45
28.5	66.55	44.35	26.602	67.95	32.605	24.66	61.376	26.37
Sept. 7.5	66.81	48.10	26.728	70.99	32.721	24.66	61.496	26.60
17.5	66.93	51.90	26.804	73.93	32.796	24.95	61.573	27.09
27.5	66.89	55.66	26.832	76.71	32.831	25.46	61.608	27.83
Oct. 7.4	66.72	59.30	26.816	79.28	32.829	26.18	61.606	28.74
17.4	66.41	62.74	26.758	81.59	32.793	27.04	61.569	29.80
27.4	65.96	65.90	26.665	83.58	32.728	28.00	61.502	30.93
Nov. 6.4	65.40	68.73	26.540	85.22	32.643	29.00	61.413	32.09
16.3	64.74	71.11	26.391	86.48	32.540	30.00	61.306	33.21
26.3	63.99	72.99	26.220	87.32	32.425	30.95	61.186	34.25
Dec. 6.3	63.17	74.33	26.036	87.71	32.305	31.82	61.061	35.16
16.2	62.31	75.07	25.844	87.65	32.183	32.56	60.935	35.90
26.2	61.43	75.19	25.649	87.13	32.065	33.17	60.811	36.46
36.2	60.56	74.66	25.458	86.16	31.953	33.60	60.695	36.83
Mean Place	58.299	28.92	21.882	47.05	28.256	53.87	57.011	55.96
Sec δ , Tan δ	4.507	+4.395	1.387	+0.962	1.035	-0.268	1.056	-0.339
$D\psi\alpha$, $D\omega\alpha$	+0.05	-0.29	+0.06	-0.06	+0.06	+0.02	+0.06	+0.02
$D\psi\delta$, $D\omega\delta$	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ Andromedæ. Mag. 5.1		41 H. Cephei. Mag. 5.0		δ Sculptoris. Mag. 4.6		ϕ Pegasi. Mag. 5.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 41	° ' " +45 57	h m 23 43	° ' " +67 20	h m 23 44	° ' " -28 34	h m 23 48	° ' " +18 39
Jan. 1.2	58.515 ^s	73.80	59.03 ^s	88.68	40.097 ^s	66.74	19.598 ^s	65.40
11.2	58.321 ¹⁹⁴	72.66 ¹¹⁴	58.59 ⁴⁴	87.73 ⁹⁵	39.971 ¹²⁶	66.68 ⁶	19.485 ¹¹³	64.43 ⁹⁷
21.2	58.141 ¹⁸⁰	71.11 ¹⁵⁵	58.17 ⁴²	86.24 ¹⁴⁹	39.860 ¹¹¹	66.30 ³⁸	19.381 ¹⁰⁴	63.31 ¹¹²
31.1	57.985 ¹⁵⁶	69.24 ¹⁸⁷	57.81 ³⁶	84.26 ¹⁹⁸	39.767 ⁹³	65.62 ⁹⁸	19.291 ⁹⁰	62.08 ¹²³
Feb. 10.1	57.860 ¹²⁵	67.09 ²¹⁵	57.50 ³¹	81.88 ²³⁸	39.697 ⁷⁰	64.64 ⁶⁸	19.221 ⁷⁰	60.82 ¹²⁶
	86	231	23	270	45	126	47	126
20.1	57.774 ⁴¹	64.78	57.27 ¹²	79.18	39.652 ¹³	63.38	19.174 ¹⁶	59.56
Mar. 2.0	57.733 ¹⁰	62.39 ²³⁹	57.15 ⁴	76.29 ²⁸⁹	39.639 ²¹	61.84 ¹⁵⁴	19.158 ¹⁸	58.38 ¹¹⁸
12.0	57.743 ⁶⁶	60.03 ²²⁴	57.11 ⁷	73.32 ²⁹⁷	39.660 ⁵⁸	60.09 ¹⁷⁵	19.176 ⁵⁶	57.34 ¹⁰⁴
22.0	57.809 ¹²³	57.79 ¹⁹⁹	57.18 ¹⁷	70.39 ²⁷⁶	39.718 ⁹⁸	58.10 ²¹⁸	19.232 ⁹⁸	56.49 ⁵⁹
Apr. 1.0	57.932 ¹⁸¹	55.80 ¹⁶⁸	57.35 ²⁸	67.63 ²⁴⁸	39.816 ¹³⁹	55.92 ²³¹	19.330 ¹³⁸	55.90 ²⁹
10.9	58.113 ²³⁷	54.12 ¹²⁹	57.63 ³⁸	65.15 ²¹¹	39.955 ¹⁸¹	53.61 ²⁴³	19.468 ¹⁸⁰	55.61 ³
20.9	58.350 ²⁸⁷	52.83 ⁸⁶	58.01 ⁴⁶	63.04 ¹⁶⁶	40.136 ²²¹	51.18 ²⁴⁹	19.648 ²²⁰	55.64 ³⁹
30.9	58.637 ³³⁰	51.97 ³⁸	58.47 ⁵⁴	61.38 ¹¹⁶	40.357 ²⁵⁷	48.69 ²⁴⁹	19.868 ²⁵⁵	56.03 ⁷⁴
May 10.9	58.967 ³⁶⁶	51.59 ¹²	59.01 ⁵⁹	60.22 ⁶²	40.614 ²⁸⁸	46.20 ²⁴⁵	20.123 ²⁸³	56.77 ¹⁰⁸
20.8	59.333 ³⁹²	51.71 ⁶¹	59.60 ⁶³	59.60 ⁵	40.902 ³¹²	43.75 ²³⁴	20.406 ³⁰⁷	57.85 ¹³⁸
30.8	59.725 ⁴⁰⁶	52.32 ¹⁰⁸	60.23 ⁶⁶	59.55 ⁵¹	41.214 ³³¹	41.41 ²¹⁸	20.713 ³²¹	59.23 ¹⁶⁶
June 9.8	60.131 ⁴¹⁰	53.40 ¹⁵³	60.89 ⁶⁶	60.06 ¹⁰⁷	41.545 ³⁴⁰	39.23 ¹⁹⁶	21.034 ³²⁷	60.89 ¹⁹⁰
19.7	60.541 ⁴⁰²	54.93 ¹⁹⁹	61.55 ⁶⁴	61.13 ¹⁵⁸	41.885 ³⁴¹	37.27 ¹⁶⁹	21.361 ³²⁵	62.79 ²⁰⁹
29.7	60.943 ³⁸⁶	56.87 ²²⁴	62.19 ⁶²	62.71 ²⁰⁶	42.226 ³³²	35.58 ¹³⁸	21.686 ³¹⁵	64.88 ²²⁰
July 9.7	61.329 ³⁶⁰	59.16 ²⁶⁰	62.81 ⁵⁷	64.77 ²⁴⁹	42.558 ³¹⁴	34.20 ¹⁰⁴	22.001 ²⁹⁵	67.08 ²²⁹
19.7	61.689 ³²⁶	61.76 ²⁸²	63.38 ⁵¹	67.26 ²⁸⁵	42.872 ²⁹⁰	33.16 ⁶⁷	22.296 ²⁷¹	69.37 ²³⁰
29.6	62.015 ²⁸³	64.58 ³⁰¹	63.89 ⁴⁴	70.11 ³¹⁶	43.162 ²⁵⁷	32.49 ²⁹	22.567 ²⁴⁰	71.67 ²²⁷
Aug. 8.6	62.298 ²³⁷	67.59 ³⁰⁹	64.33 ³⁶	73.27 ³³⁷	43.419 ²¹⁸	32.20 ⁸	22.807 ²⁰³	73.94 ²¹⁹
18.6	62.535 ¹⁸⁸	70.68 ³¹³	64.69 ²⁹	76.64 ³⁵⁶	43.637 ¹⁷⁵	32.28 ⁴⁴	23.010 ¹⁶⁵	76.13 ²⁰⁵
28.6	62.723 ¹³⁶	73.81 ³¹¹	64.98 ²⁰	80.20 ³⁶³	43.812 ¹³⁰	32.72 ⁷⁷	23.175 ¹²⁵	78.18 ¹⁹⁰
Sept. 7.5	62.859 ⁸⁵	76.92 ³⁰¹	65.18 ¹²	83.83 ³⁶⁴	43.942 ⁸⁴	33.49 ¹⁰⁷	23.300 ⁸⁵	80.08 ¹⁷¹
17.5	62.944 ³⁶	79.93 ²⁸⁸	65.30 ³	87.47 ³⁵⁹	44.026 ³⁸	34.56 ¹²⁸	23.385 ⁴⁷	81.79 ¹⁴⁹
27.5	62.980 ¹²	82.81 ²⁶⁷	65.33 ⁷	91.06 ³⁴³	44.064 ³	35.84 ¹⁴⁵	23.432 ¹¹	83.28 ¹²⁶
Oct. 7.4	62.968 ⁵³	85.48 ²⁴²	65.26 ¹³	94.49 ³²⁵	44.061 ⁴²	37.29 ¹⁵⁵	23.443 ²¹	84.54 ¹⁰³
17.4	62.915 ⁹¹	87.90 ²¹²	65.13 ²¹	97.74 ²⁹⁴	44.019 ⁷⁵	38.84 ¹⁵⁸	23.422 ⁴⁹	85.57 ⁷⁷
27.4	62.824 ¹²⁵	90.02 ¹⁷⁷	64.92 ²⁷	100.68 ²⁶⁰	43.944 ¹⁰¹	40.42 ¹⁵²	23.373 ⁷²	86.34 ⁵²
Nov. 6.4	62.699 ¹⁵³	91.79 ¹³⁸	64.65 ³³	103.28 ²¹⁷	43.843 ¹²²	41.94 ¹⁴²	23.301 ⁹⁰	86.86 ²⁷
16.3	62.546 ¹⁷⁴	93.17 ⁹⁶	64.32 ³⁸	105.45 ¹⁷⁰	43.721 ¹³⁶	43.36 ¹²⁴	23.211 ¹⁰⁵	87.13 ²
26.3	62.372 ¹⁹¹	94.13 ⁵¹	63.94 ⁴²	107.15 ¹¹⁶	43.585 ¹⁴³	44.60 ¹⁰²	23.106 ¹¹⁶	87.15 ²³
Dec. 6.3	62.181 ²⁰¹	94.64 ⁴	63.52 ⁴⁴	108.31 ⁵⁹	43.442 ¹⁴⁶	45.62 ⁷⁴	22.990 ¹²⁰	86.92 ⁴⁶
16.3	61.980 ²⁰⁵	94.68 ⁴⁴	63.08 ⁴⁶	108.90 ¹	43.296 ¹⁴³	46.36 ⁴⁷	22.870 ¹²³	86.46 ⁶⁹
26.2	61.775 ²⁰⁴	94.24 ⁹⁰	62.62 ⁴⁶	108.89 ⁶⁰	43.153 ¹³⁵	46.83 ¹⁵	22.747 ¹¹⁹	85.77 ⁸⁸
36.2	61.571	93.34	62.16	108.29	43.018	46.98	22.628	84.89
Mean Place	57.931	53.57	58.822	63.88	39.368	63.01	18.829	53.38
Sec δ , Tan δ	1.439	+1.035	2.598	+2.397	1.139	-0.545	1.056	+0.338
D ψ α , D α α	+0.06	-0.07	+0.06	-0.16	+0.06	+0.04	+0.06	-0.02
D ψ δ , D α δ	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ρ Cassiopeiæ. Mag. 4.8		Groombridge 4163. Mag. 6.6		ω Piscium. Mag. 4.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 50	° ' +57 2	h m 23 50	° ' +73 57	h m 23 55	° ' + 6 24
	s	"	s	"	s	"
Jan. 1.2	17.248	58.48	49.39	40.07	6.804	41.67
11.2	16.966 ²⁸²	57.50 ⁹⁸	48.73 ⁶⁶	39.34 ⁷³	6.700 ¹⁰⁴	40.88 ⁷⁹
21.2	16.703 ²⁶³	56.03 ¹⁴⁷	48.11 ⁶²	38.02 ¹³²	6.604 ⁹⁶	40.07 ⁸¹
31.1	16.466 ²³⁷	54.14 ¹⁸⁹	47.55 ⁵⁶	36.16 ¹⁸⁶	6.520 ⁸⁴	39.28 ⁷⁹
Feb. 10.1	16.271 ¹⁹⁵	51.88 ²²⁶	47.08 ⁴⁷	33.84 ²³²	6.454 ⁶⁶	38.55 ⁷³
	146	252	36	268	45	65
20.1	16.125 ⁸⁵	49.36	46.72	31.16	6.409 ¹⁷	37.90 ⁵¹
Mar. 2.0	16.040 ¹⁸	46.69 ²⁶⁷	46.48 ¹⁰	28.24 ²⁹²	6.392 ¹⁴	37.39 ³³
12.0	16.022 ⁵⁴	43.98 ²⁷¹	46.38 ⁵	25.19 ³⁰⁵	6.406 ⁴⁸	37.06 ¹²
22.0	16.076 ¹³⁰	41.35 ²⁶³	46.43 ²⁰	22.15 ³⁰⁴	6.454 ⁸⁷	36.94 ¹⁴
Apr. 1.0	16.206 ²⁰³	38.89 ²⁴⁶	46.63 ³⁵	19.23 ²⁹²	6.541 ¹²⁷	37.08 ⁴¹
10.9	16.409 ²⁷⁵	36.72 ¹⁸⁰	46.98 ⁴⁹	16.55 ²³⁵	6.668 ¹⁶⁷	37.49 ⁶⁹
20.9	16.684 ³³⁸	34.92 ¹³⁶	47.47 ⁵⁹	14.20 ¹⁹²	6.835 ²⁰⁵	38.18 ⁹⁷
30.9	17.022 ³⁹⁴	33.56 ⁸⁸	48.06 ⁷⁰	12.28 ¹⁴³	7.040 ²³⁸	39.15 ¹²⁵
May 10.9	17.416 ⁴⁴⁰	32.68 ³⁶	48.76 ⁷⁸	10.85 ⁸⁸	7.278 ²⁶⁸	40.40 ¹⁴⁸
20.8	17.856 ⁴⁷¹	32.32 ¹⁸	49.54 ⁸⁴	9.97 ³²	7.546 ²⁹²	41.88 ¹⁷¹
30.8	18.327 ⁴⁹²	32.50 ⁷¹	50.38 ⁸⁷	9.65 ²⁵	7.838 ³⁰⁸	43.59 ¹⁸⁷
June 9.8	18.819 ⁴⁹⁷	33.21 ¹²²	51.25 ⁸⁸	9.90 ⁸²	8.146 ³¹⁵	45.46 ¹⁹⁹
19.7	19.316 ⁴⁸⁹	34.43 ¹⁶⁹	52.13 ⁸⁶	10.72 ¹³⁶	8.461 ³¹⁶	47.45 ²⁰⁶
29.7	19.805 ⁴⁷⁰	36.12 ²¹²	52.99 ⁸³	12.08 ¹⁸⁶	8.777 ³⁰⁶	49.51 ²⁰⁷
July 9.7	20.275 ⁴³⁹	38.24 ²⁵⁰	53.82 ⁷⁷	13.94 ²³³	9.083 ²⁹²	51.58 ²⁰⁴
19.7	20.714 ³⁹⁸	40.74 ²⁸¹	54.59 ⁶⁹	16.27 ²⁷⁴	9.375 ²⁶⁷	53.62 ¹⁹⁵
29.6	21.112 ³⁵⁰	43.55 ³⁰⁸	55.28 ⁶¹	19.01 ³⁰⁸	9.642 ²⁴⁰	55.57 ¹⁸²
Aug. 8.6	21.462 ²⁹⁴	46.63 ³²⁴	55.89 ⁵⁰	22.09 ³³⁴	9.882 ²⁰⁵	57.39 ¹⁶⁵
18.6	21.756 ²³³	49.87 ³³⁶	56.39 ³⁹	25.43 ³⁵⁵	10.087 ¹⁶⁸	59.04 ¹⁴⁶
28.6	21.989 ¹⁷³	53.23 ³⁴¹	56.78 ²⁸	28.98 ³⁶⁹	10.255 ¹³⁰	60.50 ¹²²
Sept. 7.5	22.162 ¹¹⁰	56.64 ³³⁹	57.06 ¹⁷	32.67 ³⁷³	10.385 ⁹²	61.72 ¹⁰⁰
17.5	22.272 ⁴⁸	60.03 ³²⁹	57.23 ⁴	36.40 ³⁷¹	10.477 ⁵³	62.72 ⁷⁶
27.5	22.320 ¹²	63.32 ³¹³	57.27 ⁷	40.11 ³⁰²	10.530 ¹⁸	63.48 ⁵⁴
Oct. 7.4	22.308 ⁶⁷	66.45 ²⁹²	57.20 ¹⁸	43.73 ³⁴³	10.548 ¹³	64.02 ³¹
17.4	22.241 ¹¹⁷	69.37 ²⁶²	57.02 ²⁹	47.16 ³¹⁸	10.535 ⁴⁰	64.33 ¹¹
27.4	22.124 ¹⁶⁴	71.99 ²²⁷	56.73 ³⁹	50.34 ²⁸⁵	10.495 ⁶³	64.44 ⁷
Nov. 6.4	21.960 ²⁰³	74.26 ¹⁸⁸	56.34 ⁴⁸	53.19 ²⁴⁴	10.432 ⁸⁰	64.37 ²⁵
16.3	21.757 ²³⁶	76.14 ¹⁴²	55.86 ⁵⁴	55.63 ¹⁹⁶	10.352 ⁹⁵	64.12 ³⁹
26.3	21.521 ²⁶⁴	77.56 ⁹²	55.32 ⁶¹	57.59 ¹⁴²	10.257 ¹⁰⁴	63.73 ⁵²
Dec. 6.3	21.257 ²⁸¹	78.48 ⁴⁰	54.71 ⁶⁶	59.01 ⁸⁵	10.153 ¹¹⁰	63.21 ⁶³
16.3	20.976 ²⁹¹	78.88 ¹⁴	54.05 ⁶⁷	59.86 ²⁴	10.043 ¹¹²	62.58 ⁷³
26.2	20.685 ²⁹⁰	78.74 ⁶⁸	53.38 ⁶⁸	60.10 ³⁸	9.931 ¹¹¹	61.85 ⁷⁸
36.2	20.395	78.06	52.70	59.72	9.820	61.07
Mean Place	16.694	35.51	49.347	14.25	5.977	33.85
Sec δ , Tan δ	1.838	+1.543	3.619	+3.478	1.006	+0.112
$D\psi a, D\omega a$	+0.06	-0.10	+0.06	-0.23	+0.06	-0.01
$D\psi \delta, D\omega \delta$	+0.4	0.0	+0.4	0.0	+0.4	0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington on Time.	ε Tucane. Mag. 4.7		30 Piscium. Mag. 4.7		2 Ceti. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 55	° ' " -66 1	h m 23 57	° ' " - 6 27	h m 23 59	° ' " -17 47
a. 1.2	40.31	70.83	46.130	67.88	33.249	33.68
11.2	39.90 41	69.72 111	46.026 104	68.43 55	33.136 113	33.98 30
21.2	39.53 37	68.08 164	45.930 96	68.87 44	33.032 104	34.06 8
31.1	39.21 32	65.95 213	45.846 84	69.17 30	32.941 91	33.90 16
b. 10.1	38.94 27	63.39 256	45.780 66	69.31 14	32.868 73	33.50 40
	20	291	46	3	51	65
20.1	38.74	60.48	45.734	69.28	32.817	32.85
r. 2.1	38.61 13	57.26 322	45.716 18	69.04 24	32.793 24	31.97 88
12.0	38.56 5	53.82 344	45.727 11	68.59 45	32.801 8	30.83 114
22.0	38.59 3	50.25 357	45.772 45	67.91 68	32.842 41	29.47 136
r. 1.0	38.70 11	46.62 363	45.855 83	66.99 92	32.922 80	27.89 158
	18	362	121	117	120	179
10.9	38.88	43.00	45.976	65.82	33.042	26.10
20.9	39.15 27	39.49 351	46.136 160	64.44 138	33.201 159	24.14 196
30.9	39.51 36	36.13 336	46.334 198	62.84 160	33.400 199	22.03 211
iv 10.9	39.93 42	33.01 312	46.566 232	61.07 177	33.633 233	19.83 220
20.8	40.41 48	30.20 281	46.829 263	59.15 192	33.898 265	17.58 225
	54	244	287	202	291	226
30.8	40.95	27.76 201	47.116 305	57.13 207	34.189 310	15.32 220
ne 9.8	41.52 57	25.75 154	47.421 313	55.06 206	34.499 320	13.12 208
19.8	42.12 60	24.21 102	47.734 314	53.00 201	34.819 323	11.04 192
29.7	42.73 61	23.19 49	48.048 306	50.99 190	35.142 317	9.12 170
ly 9.7	43.33 57	22.70 7	48.354 293	49.09 175	35.459 301	7.42 146
19.7	43.90	22.77 60	48.647 271	47.34 154	35.760 280	5.96 115
29.6	44.44 54	23.37 112	48.918 242	45.80 132	36.040 252	4.81 84
ig. 8.6	44.92 48	24.49 160	49.160 209	44.48 105	36.292 217	3.97 51
18.6	45.34 32	26.09 204	49.369 173	43.43 78	36.509 179	3.46 18
28.6	45.66 24	28.13 238	49.541 132	42.65 51	36.688 139	3.28 14
pt. 7.5	45.90 13	30.51 265	49.673 94	42.14 28	36.827 96	3.42 43
17.5	46.03 4	33.16 282	49.767 55	41.91 1	36.923 55	3.85 69
27.5	46.07 5	35.98 287	49.822 19	41.92 26	36.978 17	4.54 91
t. 7.5	46.02 16	38.85 281	49.841 14	42.17 48	36.995 17	5.45 105
17.4	45.86 23	41.66 263	49.827 41	42.60 58	36.978 48	6.50 116
27.4	45.63 31	44.29 237	49.786 65	43.18 70	36.930 74	7.66 120
iv. 6.4	45.32 37	46.66 197	49.721 84	43.88 76	36.856 98	8.86 117
16.3	44.95 41	48.63 153	49.637 97	44.64 80	36.763 108	10.03 111
26.3	44.54 43	50.15 100	49.540 107	45.44 81	36.655 119	11.14 100
sc. 6.3	44.11 45	51.15 43	49.433 111	46.25 77	36.536 123	12.14 85
16.3	43.66 45	51.58 15	49.322 113	47.02 70	36.413 124	12.99 66
26.2	43.21 48	51.43 74	49.209 112	47.72 64	36.289 122	13.65 46
36.2	42.78	50.69	49.097	48.36	36.167	14.11
Place	39.879	58.99	45.291	71.20	32.414	33.19
l, Tan δ	2.462	-2.249	1.006	-0.113	1.050	-0.321
D _α α	+0.06	+0.15	+0.06	+0.01	+0.06	+0.02
D _α δ	+0.4	0.0	+0.4	0.0	+0.4	0.0

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass Merid.	h m s
Jan.	h m s	s	° ' "	"	m s	s	' "	m s	h
1	18 45 42.04	11.042	-23 2 3.5	+12.05	+ 3 32.40	+1.183	16 17.88	1 11.05	18
2	18 50 6.92	11.030	22 57 0.5	13.20	4 0.65	1.170	16 17.88	1 11.01	18
3	18 54 31.46	11.016	22 51 29.8	14.34	4 28.57	1.156	16 17.87	1 10.96	18
4	18 58 55.65	11.000	22 45 32.0	15.47	4 56.12	1.140	16 17.86	1 10.91	18
5	19 3 19.47	10.983	22 39 7.0	16.60	5 23.29	1.123	16 17.84	1 10.85	18
6	19 7 42.85	10.965	-22 32 15.0	+17.73	+ 5 50.06	+1.106	16 17.81	1 10.79	19
7	19 12 5.79	10.946	22 24 56.2	18.84	6 16.37	1.087	16 17.78	1 10.73	19
8	19 16 28.26	10.926	22 17 10.9	19.94	6 42.20	1.067	16 17.75	1 10.66	19
9	19 20 50.24	10.904	22 8 59.2	21.03	7 7.55	1.045	16 17.71	1 10.58	19
10	19 25 11.68	10.882	22 0 21.5	22.11	7 32.36	1.022	16 17.67	1 10.50	19
11	19 29 32.56	10.858	-21 51 17.9	+23.18	+ 7 56.62	+0.998	16 17.62	1 10.43	19
12	19 33 52.86	10.833	21 41 48.8	24.23	8 20.31	0.974	16 17.57	1 10.35	19
13	19 38 12.56	10.807	21 31 54.4	25.28	8 43.38	0.948	16 17.52	1 10.26	19
14	19 42 31.61	10.780	21 21 35.0	26.32	9 5.81	0.921	16 17.47	1 10.17	19
15	19 46 50.00	10.752	21 10 51.0	27.34	9 27.59	0.893	16 17.41	1 10.08	19
16	19 51 7.70	10.723	-20 59 42.7	+28.34	+ 9 48.67	+0.864	16 17.35	1 9.99	19
17	19 55 24.69	10.693	20 48 10.5	29.33	10 9.04	0.834	16 17.28	1 9.90	19
18	19 59 40.96	10.662	20 36 14.6	30.32	10 28.70	0.803	16 17.20	1 9.80	19
19	20 3 56.48	10.631	20 23 55.3	31.29	10 47.62	0.772	16 17.13	1 9.70	19
20	20 8 11.25	10.599	20 11 13.1	32.23	11 5.77	0.740	16 17.04	1 9.60	19
21	20 12 25.23	10.567	-19 58 8.3	+33.16	+11 23.16	+0.708	16 16.96	1 9.50	20
22	20 16 38.44	10.534	19 44 41.3	34.09	11 39.76	0.676	16 16.87	1 9.39	20
23	20 20 50.86	10.501	19 30 52.2	34.99	11 55.58	0.643	16 16.77	1 9.29	20
24	20 25 2.48	10.468	19 16 41.7	35.88	12 10.60	0.610	16 16.67	1 9.18	20
25	20 29 13.30	10.434	19 2 9.9	36.76	12 24.83	0.576	16 16.56	1 9.07	20
26	20 33 23.32	10.401	-18 47 17.1	+37.62	+12 38.26	+0.543	16 16.45	1 8.96	20
27	20 37 32.53	10.367	18 32 3.8	38.47	12 50.87	0.509	16 16.32	1 8.85	20
28	20 41 40.92	10.333	18 16 30.5	39.30	13 2.68	0.475	16 16.19	1 8.73	20
29	20 45 48.51	10.299	18 0 37.4	40.11	13 13.68	0.442	16 16.06	1 8.62	20
30	20 49 55.28	10.266	17 44 24.9	40.92	13 23.87	0.408	16 15.92	1 8.51	20
31	20 54 1.25	10.232	-17 27 53.5	+41.69	+13 33.26	+0.375	16 15.78	1 8.39	20
Feb.	h m s	s	° ' "	"	m s	s	' "	m s	h
1	20 58 6.41	10.198	17 11 3.4	42.46	13 41.84	0.341	16 15.64	1 8.28	20
2	21 2 10.75	10.164	16 53 55.1	43.22	13 49.60	0.307	16 15.48	1 8.15	20
3	21 6 14.30	10.131	16 36 28.9	43.96	13 56.56	0.274	16 15.33	1 8.04	20
4	21 10 17.04	10.098	16 18 45.4	44.67	14 2.73	0.241	16 15.16	1 7.93	20
5	21 14 18.97	10.064	-16 0 44.8	+45.37	+14 8.10	+0.207	16 14.98	1 7.81	21
6	21 18 20.11	10.031	15 42 27.6	46.06	14 12.67	0.174	16 14.81	1 7.70	21
7	21 22 20.46	9.998	15 23 54.2	46.72	14 16.46	0.141	16 14.64	1 7.59	21
8	21 26 20.03	9.965	15 5 5.1	47.37	14 19.46	0.108	16 14.47	1 7.47	21
9	21 30 18.80	9.933	14 46 0.8	47.99	14 21.67	0.076	16 14.29	1 7.36	21
10	21 34 16.79	9.900	-14 26 41.4	+48.61	+14 23.10	+0.044	16 14.11	1 7.25	21
11	21 38 14.01	9.868	14 7 7.7	49.19	14 23.77	+0.011	16 13.93	1 7.14	21
12	21 42 10.45	9.836	13 47 20.0	49.77	14 23.65	-0.021	16 13.74	1 7.03	21
13	21 46 6.13	9.803	13 27 18.7	50.33	14 22.77	0.053	16 13.55	1 6.92	21
14	21 50 1.02	9.771	13 7 4.5	50.86	14 21.11	0.085	16 13.36	1 6.81	21
15	21 53 55.16	9.740	-12 46 37.5	+51.38	+14 18.71	-0.116	16 13.17	1 6.71	21
16	21 57 48.56	9.709	-12 25 58.4	+51.88	+14 15.56	-0.147	16 12.98	1 6.60	21

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal inter

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ' "	"	m s	s	' "	m s	h m s
j. 16	21 57 48.56	9.709	-12 25 58.4	+51.88	+14 15.56	-0.147	16 12.98	1 6.80	21 43 30.86
17	22 1 41.21	9.679	12 5 7.3	52.36	14 11.68	0.178	16 12.78	1 6.50	21 47 27.21
18	22 5 33.15	9.649	11 44 5.0	52.83	14 7.06	0.207	16 12.58	1 6.40	21 51 23.76
19	22 9 24.37	9.620	11 22 51.7	53.27	14 1.74	0.236	16 12.38	1 6.30	21 55 20.32
20	22 13 14.89	9.591	11 1 27.8	53.71	13 55.73	0.265	16 12.17	1 6.20	21 59 16.87
21	22 17 4.74	9.563	-10 39 53.7	+54.13	+13 49.04	-0.293	16 11.95	1 6.11	22 3 13.43
22	22 20 53.91	9.535	10 18 9.8	54.53	13 41.69	0.320	16 11.73	1 6.02	22 7 9.98
23	22 24 42.45	9.509	9 56 16.5	54.91	13 33.69	0.347	16 11.51	1 5.93	22 11 6.53
24	22 28 30.37	9.484	9 34 14.2	55.28	13 25.07	0.371	16 11.29	1 5.84	22 15 3.09
25	22 32 17.67	9.459	9 12 3.3	55.62	13 15.85	0.396	16 11.06	1 5.75	22 18 59.64
26	22 36 4.39	9.435	-8 49 44.0	+55.96	+13 6.04	-0.421	16 10.83	1 5.67	22 22 56.19
27	22 39 50.55	9.411	8 27 17.0	56.29	12 55.67	0.444	16 10.60	1 5.58	22 26 52.75
28	22 43 36.15	9.389	8 4 42.5	56.58	12 44.76	0.466	16 10.36	1 5.50	22 30 49.30
r. 1	22 47 21.23	9.368	7 42 0.9	56.87	12 33.32	0.487	16 10.11	1 5.43	22 34 45.85
2	22 51 5.81	9.348	7 19 12.4	57.15	12 21.37	0.508	16 9.87	1 5.35	22 38 42.41
3	22 54 49.90	9.328	-6 56 17.7	+57.40	+12 8.94	-0.527	16 9.62	1 5.29	22 42 38.96
4	22 58 33.53	9.309	6 33 17.1	57.64	11 56.05	0.546	16 9.37	1 5.22	22 46 35.51
5	23 2 16.71	9.290	6 10 10.8	57.87	11 42.72	0.565	16 9.11	1 5.15	22 50 32.07
6	23 5 59.47	9.273	5 46 59.4	58.07	11 28.97	0.582	16 8.86	1 5.09	22 54 28.62
7	23 9 41.82	9.257	5 23 43.2	58.27	11 14.81	0.597	16 8.59	1 5.03	22 58 25.17
8	23 13 23.81	9.242	-5 0 22.4	+58.45	+11 0.28	-0.613	16 8.33	1 4.97	23 2 21.73
9	23 17 5.41	9.227	4 36 57.8	58.60	10 45.37	0.628	16 8.07	1 4.91	23 6 18.28
10	23 20 46.68	9.212	4 13 29.6	58.74	10 30.12	0.642	16 7.81	1 4.86	23 10 14.83
11	23 24 27.61	9.199	3 49 58.1	58.87	10 14.54	0.656	16 7.55	1 4.81	23 14 11.38
12	23 28 8.23	9.186	3 26 23.8	58.98	9 58.64	0.669	16 7.28	1 4.77	23 18 7.94
13	23 31 48.53	9.174	-3 2 47.2	+59.07	+9 42.45	-0.681	16 7.02	1 4.72	23 22 4.49
14	23 35 28.56	9.162	2 39 8.6	59.14	9 25.97	0.692	16 6.76	1 4.68	23 26 1.04
15	23 39 8.31	9.151	2 15 28.4	59.20	9 9.21	0.703	16 6.50	1 4.64	23 29 57.60
16	23 42 47.81	9.141	1 51 47.1	59.24	8 52.21	0.713	16 6.23	1 4.61	23 33 54.15
17	23 46 27.08	9.132	1 28 4.9	59.26	8 34.97	0.723	16 5.97	1 4.58	23 37 50.70
18	23 50 6.14	9.123	-1 4 22.4	+59.27	+8 17.51	-0.732	16 5.71	1 4.55	23 41 47.25
19	23 53 44.99	9.116	0 40 39.8	59.27	7 59.86	0.740	16 5.44	1 4.52	23 45 43.81
20	23 57 23.66	9.109	-0 16 57.5	59.24	7 42.04	0.746	16 5.18	1 4.51	23 49 40.36
21	0 1 2.17	9.102	+0 6 44.2	59.21	7 24.04	0.752	16 4.91	1 4.49	23 53 36.91
22	0 4 40.56	9.097	0 30 24.8	59.17	7 5.93	0.757	16 4.64	1 4.47	23 57 33.47
23	0 8 18.84	9.093	+0 54 4.2	+59.11	+6 47.71	-0.762	16 4.37	1 4.46	0 1 30.02
24	0 11 57.03	9.090	1 17 41.8	59.02	6 29.39	0.765	16 4.10	1 4.45	0 5 26.57
25	0 15 35.15	9.088	1 41 17.5	58.94	6 11.01	0.767	16 3.83	1 4.44	0 9 23.12
26	0 19 13.23	9.086	2 4 50.9	58.84	5 52.58	0.768	16 3.56	1 4.44	0 13 19.68
27	0 22 51.29	9.086	2 28 21.4	58.71	5 34.14	0.768	16 3.28	1 4.44	0 17 16.23
28	0 26 29.35	9.086	+2 51 49.0	+58.58	+5 15.70	-0.768	16 3.01	1 4.44	0 21 12.78
29	0 30 7.44	9.088	3 15 13.2	58.44	4 57.29	0.767	16 2.73	1 4.45	0 25 9.33
30	0 33 45.57	9.091	3 38 33.8	58.28	4 38.92	0.763	16 2.45	1 4.45	0 29 5.99
31	0 37 23.79	9.094	4 1 50.3	58.10	4 20.63	0.760	16 2.17	1 4.46	0 33 2.44
r. 1	0 41 2.09	9.098	4 25 2.5	57.91	4 2.43	0.756	16 1.89	1 4.47	0 36 58.99
2	0 44 40.51	9.103	+4 48 10.0	+57.71	+3 44.35	-0.751	16 1.61	1 4.49	0 40 55.55
3	0 48 19.07	9.110	+5 11 12.4	+57.49	+3 26.40	-0.745	16 1.33	1 4.51	0 44 52.10

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Semi. Pass Merid.	Sk Ti Mean
	h m s	s	° ' "	"	m s	s	' "	m s	h n
Apr. 1	0 41 2.09	9.008	+ 4 25 2.5	+57.91	+4 2.43	-0.756	16 1.89	1 4.47	0 30
2	0 44 40.51	9.103	4 48 10.0	57.71	3 44.35	0.751	16 1.61	1 4.49	0 40
3	0 48 19.07	9.110	5 11 12.4	57.49	3 26.40	0.745	16 1.33	1 4.51	0 40
4	0 51 57.79	9.117	5 34 9.5	57.26	3 8.62	0.738	16 1.04	1 4.53	0 40
5	0 55 36.68	9.125	5 57 0.9	57.02	2 51.00	0.730	16 0.76	1 4.56	0 50
6	0 59 15.77	9.133	+ 6 19 46.1	+56.75	+2 33.59	-0.721	16 0.48	1 4.59	0 50
7	1 2 55.08	9.143	6 42 25.0	56.48	2 16.40	0.712	16 0.20	1 4.62	1 00
8	1 6 34.62	9.152	7 4 57.0	56.19	1 59.43	0.702	15 59.92	1 4.65	1 00
9	1 10 14.40	9.163	7 27 22.0	55.98	1 42.70	0.692	15 59.65	1 4.69	1 00
10	1 13 54.43	9.174	7 49 39.3	55.56	1 26.22	0.681	15 59.37	1 4.73	1 10
11	1 17 34.74	9.186	+ 8 11 48.8	+55.28	+1 10.03	-0.669	15 59.10	1 4.77	1 10
12	1 21 15.34	9.198	8 33 50.0	54.87	0 54.11	0.657	15 58.83	1 4.81	1 20
13	1 24 56.22	9.210	8 55 42.5	54.50	0 38.49	0.644	15 58.56	1 4.85	1 20
14	1 28 37.41	9.223	9 17 26.1	54.12	0 23.18	0.631	15 58.30	1 4.90	1 20
15	1 32 18.93	9.237	9 39 0.4	53.72	+0 8.17	0.618	15 58.04	1 4.95	1 30
16	1 36 0.77	9.251	+10 0 24.9	+53.31	-0 6.50	-0.604	15 57.78	1 5.00	1 30
17	1 39 42.97	9.265	10 21 39.4	52.89	0 20.82	0.589	15 57.52	1 5.06	1 40
18	1 43 25.51	9.280	10 42 43.7	52.46	0 34.79	0.574	15 57.26	1 5.11	1 40
19	1 47 8.44	9.297	11 3 37.3	52.00	0 48.38	0.559	15 57.01	1 5.17	1 40
20	1 50 51.76	9.314	11 24 20.0	51.54	1 1.58	0.541	15 56.76	1 5.23	1 50
21	1 54 35.48	9.331	+11 44 51.3	+51.07	-1 14.37	-0.524	15 56.50	1 5.29	1 50
22	1 58 19.62	9.349	12 5 11.1	50.57	1 26.76	0.507	15 56.25	1 5.36	1 50
23	2 2 4.20	9.367	12 25 19.0	50.07	1 38.70	0.488	15 56.00	1 5.42	2 00
24	2 5 49.23	9.386	12 45 14.5	49.56	1 50.19	0.469	15 55.75	1 5.49	2 00
25	2 9 34.72	9.405	13 4 57.6	49.08	2 1.22	0.450	15 55.50	1 5.56	2 10
26	2 13 20.69	9.425	+13 24 27.8	+48.48	-2 11.78	-0.430	15 55.25	1 5.63	2 10
27	2 17 7.16	9.446	13 43 44.8	47.98	2 21.84	0.409	15 55.00	1 5.70	2 10
28	2 20 54.13	9.468	14 2 48.3	47.36	2 31.39	0.387	15 54.75	1 5.78	2 20
29	2 24 41.61	9.490	14 21 38.0	46.78	2 40.44	0.365	15 54.50	1 5.86	2 20
30	2 28 29.63	9.512	14 40 13.7	46.18	2 48.95	0.343	15 54.26	1 5.94	2 30
May 1	2 32 18.20	9.535	+14 58 35.0	+45.58	-2 56.91	-0.320	15 54.01	1 6.01	2 30
2	2 36 7.32	9.558	15 16 41.5	44.96	3 4.33	0.297	15 53.77	1 6.09	2 30
3	2 39 57.01	9.582	15 34 33.0	44.32	3 11.18	0.274	15 53.53	1 6.17	2 40
4	2 43 47.26	9.606	15 52 9.1	43.68	3 17.47	0.250	15 53.29	1 6.25	2 40
5	2 47 38.09	9.630	16 9 29.5	43.02	3 23.17	0.226	15 53.05	1 6.33	2 50
6	2 51 29.50	9.654	+16 26 33.9	+42.34	-3 28.31	-0.202	15 52.82	1 6.41	2 50
7	2 55 21.50	9.679	16 43 22.0	41.65	3 32.85	0.177	15 52.59	1 6.49	2 50
8	2 59 14.08	9.703	16 59 53.4	40.96	3 36.82	0.153	15 52.36	1 6.57	3 00
9	3 3 7.24	9.727	17 16 8.0	40.26	3 40.20	0.129	15 52.14	1 6.65	3 00
10	3 7 0.98	9.751	17 32 5.1	39.51	3 43.01	0.105	15 51.93	1 6.74	3 10
11	3 10 55.30	9.775	+17 47 44.8	+38.78	-3 45.24	-0.081	15 51.71	1 6.82	3 10
12	3 14 50.19	9.799	18 3 6.3	38.02	3 46.90	0.057	15 51.51	1 6.90	3 10
13	3 18 45.64	9.822	18 18 9.7	37.26	3 48.00	0.034	15 51.31	1 6.98	3 20
14	3 22 41.66	9.846	18 32 54.8	36.48	3 48.54	-0.011	15 51.11	1 7.06	3 20
15	3 26 38.24	9.869	18 47 20.9	35.69	3 48.52	+0.012	15 50.91	1 7.15	3 30
16	3 30 35.37	9.892	+19 1 28.0	+34.89	-3 47.94	+0.036	15 50.72	1 7.23	3 30
17	3 34 33.04	9.915	+19 15 15.8	+34.09	-3 46.82	+0.058	15 50.53	1 7.31	3 30

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal inter-

FOR WASHINGTON APPARENT NOON.

ste.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Equation of Time. Mean—App.		Var. per Hour.	Semi- diameter.			S. T. of Sem. Pass. Merid.		Sidereal Time of Mean Noon.		
	h	m	s	s	°	'	"	"	m	s	s	'	"	m	s		h	m	s
17	3	34	33.04	9.915	+19	15	15.8	+34.09	-3	46.82	+0.068	15	50.53	1	7.31		3	38	20.49
18	3	38	31.27	9.938	19	28	43.9	33.26	3	45.16	0.061	15	50.34	1	7.39		3	42	17.04
19	3	42	30.04	9.960	19	41	52.3	32.43	3	42.96	0.103	15	50.16	1	7.47		3	46	13.60
20	3	46	29.34	9.982	19	54	40.6	31.59	3	40.22	0.125	15	49.98	1	7.55		3	50	10.16
21	3	50	29.17	10.004	20	7	8.5	30.74	3	36.95	0.147	15	49.81	1	7.62		3	54	6.71
22	3	54	29.54	10.026	+20	19	15.7	+29.86	-3	33.16	+0.169	15	49.63	1	7.70		3	58	3.27
23	3	58	30.42	10.047	20	31	2.2	26.99	3	28.84	0.191	15	49.46	1	7.77		4	1	59.83
24	4	2	31.81	10.068	20	42	27.5	26.11	3	24.02	0.211	15	49.29	1	7.85		4	5	56.38
25	4	6	33.71	10.089	20	53	31.5	27.22	3	18.69	0.232	15	49.12	1	7.91		4	9	52.94
26	4	10	36.12	10.110	21	4	14.0	26.32	3	12.85	0.253	15	48.97	1	7.98		4	13	49.50
27	4	14	39.01	10.130	+21	14	34.9	+25.42	-3	6.53	+0.273	15	48.81	1	8.05		4	17	46.05
28	4	18	42.40	10.151	21	24	33.7	24.49	2	59.71	0.293	15	48.65	1	8.12		4	21	42.61
29	4	22	46.26	10.170	21	34	10.4	23.56	2	52.43	0.313	15	48.49	1	8.18		4	25	39.17
30	4	26	50.59	10.190	21	43	24.6	22.62	2	44.68	0.333	15	48.33	1	8.24		4	29	35.73
31	4	30	55.38	10.209	21	52	16.3	21.68	2	36.47	0.351	15	48.18	1	8.30		4	33	32.28
6 1	4	35	0.61	10.227	+22	0	45.2	+20.73	-2	27.82	+0.369	15	48.04	1	8.36		4	37	28.84
2	4	39	6.28	10.245	22	8	51.2	19.76	2	18.74	0.387	15	47.89	1	8.42		4	41	25.40
3	4	43	12.35	10.261	22	16	34.1	18.80	2	9.24	0.404	15	47.75	1	8.47		4	45	21.95
4	4	47	18.83	10.277	22	23	53.5	17.82	1	59.36	0.419	15	47.61	1	8.52		4	49	18.51
5	4	51	25.67	10.293	22	30	49.4	16.84	1	49.09	0.435	15	47.48	1	8.57		4	53	15.07
6	4	55	32.87	10.307	+22	37	21.7	+15.85	-1	38.48	+0.449	15	47.36	1	8.62		4	57	11.63
7	4	59	40.40	10.320	22	43	30.3	14.86	1	27.54	0.463	15	47.24	1	8.66		5	1	8.18
8	5	3	48.25	10.332	22	49	14.9	13.86	1	16.29	0.474	15	47.13	1	8.70		5	5	4.74
9	5	7	56.36	10.343	22	54	35.5	12.86	1	4.76	0.485	15	47.02	1	8.74		5	9	1.30
10	5	12	4.73	10.353	22	59	31.9	11.84	0	52.98	0.496	15	46.92	1	8.77		5	12	57.86
11	5	16	13.34	10.363	+23	4	4.0	+10.83	-0	40.96	+0.506	15	46.82	1	8.80		5	16	54.41
12	5	20	22.14	10.370	23	8	11.7	9.81	0	28.75	0.513	15	46.72	1	8.83		5	20	50.97
13	5	24	31.12	10.377	23	11	54.9	8.79	0	16.36	0.519	15	46.63	1	8.86		5	24	47.53
14	5	28	40.25	10.383	23	15	13.8	7.77	-0	3.81	0.525	15	46.55	1	8.87		5	28	44.09
15	5	32	49.52	10.388	23	18	7.9	6.74	+0	8.86	0.530	15	46.47	1	8.89		5	32	40.64
16	5	36	58.90	10.393	+23	20	37.5	+5.72	+0	21.64	+0.535	15	46.41	1	8.91		5	36	37.20
17	5	41	8.36	10.395	23	22	42.3	4.69	0	34.51	0.538	15	46.34	1	8.92		5	40	33.76
18	5	45	17.88	10.397	23	24	22.4	3.66	0	47.43	0.539	15	46.27	1	8.93		5	44	30.32
19	5	49	27.43	10.398	23	25	37.6	2.62	1	0.40	0.540	15	46.21	1	8.94		5	48	26.87
20	5	53	37.01	10.399	23	26	28.1	1.59	1	13.38	0.541	15	46.15	1	8.95		5	52	23.43
21	5	57	46.57	10.398	+23	26	53.9	+0.56	+1	26.35	+0.540	15	46.09	1	8.95		5	56	19.99
22	6	1	56.12	10.397	23	26	55.0	-0.47	1	39.30	0.539	15	46.04	1	8.94		6	0	16.55
23	6	6	5.61	10.394	23	26	31.2	1.51	1	52.20	0.536	15	45.99	1	8.94		6	4	13.10
24	6	10	15.04	10.391	23	25	42.5	2.54	2	5.03	0.533	15	45.95	1	8.93		6	8	9.66
25	6	14	24.38	10.387	23	24	29.2	3.57	2	17.78	0.529	15	45.90	1	8.91		6	12	6.22
26	6	18	33.61	10.382	+23	22	51.1	-4.60	+2	30.42	+0.524	15	45.86	1	8.90		6	16	2.78
27	6	22	42.72	10.377	23	20	48.4	5.63	2	42.95	0.519	15	45.83	1	8.88		6	19	59.33
28	6	26	51.69	10.371	23	18	21.0	6.66	2	55.33	0.513	15	45.80	1	8.84		6	23	55.89
29	6	31	0.51	10.363	23	15	29.1	7.68	3	7.55	0.505	15	45.77	1	8.82		6	27	52.45
30	6	35	9.14	10.355	23	12	12.6	8.70	3	19.58	0.497	15	45.74	1	8.79		6	31	49.01
7 1	6	39	17.56	10.346	+23	8	31.6	-9.72	+3	31.42	+0.489	15	45.73	1	8.76		6	35	45.57
2	6	43	25.76	10.337	+23	4	26.3	-10.73	+3	43.04	+0.479	15	45.71	1	8.72		6	39	42.12

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.10 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

FOR WASHINGTON APPARENT NOON.										Std Th Mean		
Date.	Apparent Right Ascension.		Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Semi. Pass. Merid.			
	h	m	s	°	'	″	s	'	″	h	m	
July	1	6 39	17.56	10.346	+23	8 31.6	-9.72	+3 31.42	+0.489	15 45.73	1 8.76	6 35
	2	6 43	25.76	10.337	23	4 26.3	10.73	3 43.04	0.479	15 45.71	1 8.72	6 39
	3	6 47	33.72	10.326	22 59	56.8	11.73	3 54.40	0.468	15 45.70	1 8.68	6 43
	4	6 51	41.41	10.314	22 55	3.2	12.73	4 5.49	0.456	15 45.69	1 8.64	6 47
	5	6 55	48.79	10.301	22 49	45.5	13.73	4 16.30	0.443	15 45.69	1 8.60	6 51
	6	6 59	55.86	10.287	+22 44	4.0	-14.72	+4 26.78	+0.430	15 45.69	1 8.55	6 55
	7	7 4	2.58	10.273	22 37	58.8	15.71	4 36.92	0.415	15 45.70	1 8.50	6 59
	8	7 8	8.95	10.257	22 31	29.9	16.69	4 46.70	0.400	15 45.72	1 8.45	7 3
	9	7 12	14.92	10.240	22 24	37.7	17.66	4 56.08	0.382	15 45.74	1 8.39	7 7
	10	7 16	20.48	10.223	22 17	22.2	18.63	5 5.07	0.365	15 45.77	1 8.34	7 11
	11	7 20	25.62	10.204	+22 9	43.9	-19.57	+5 13.61	+0.347	15 45.81	1 8.28	7 15
	12	7 24	30.29	10.185	22	1 42.6	20.52	5 21.72	0.328	15 45.84	1 8.22	7 19
	13	7 28	34.50	10.166	21 53	18.7	21.46	5 29.34	0.308	15 45.89	1 8.15	7 23
	14	7 32	38.22	10.145	21 44	32.2	22.40	5 36.49	0.288	15 45.93	1 8.09	7 27
	15	7 36	41.44	10.123	21 35	23.7	23.32	5 43.14	0.266	15 45.99	1 8.02	7 30
	16	7 40	44.15	10.101	+21 25	53.1	-24.23	+5 49.27	+0.244	15 46.04	1 7.95	7 34
	17	7 44	46.33	10.079	21 16	0.7	25.13	5 54.88	0.222	15 46.11	1 7.87	7 38
	18	7 48	47.97	10.057	21 5	46.7	26.03	5 59.95	0.200	15 46.17	1 7.79	7 42
	19	7 52	49.05	10.034	20 55	11.4	26.91	6 4.46	0.176	15 46.24	1 7.72	7 46
	20	7 56	49.58	10.010	20 44	14.8	27.79	6 8.42	0.153	15 46.32	1 7.64	7 50
	21	8 0	49.54	9.987	+20 32	57.5	-28.66	+6 11.82	+0.130	15 46.40	1 7.56	7 54
	22	8 4	48.94	9.963	20 21	19.3	29.51	6 14.65	0.106	15 46.48	1 7.48	7 58
	23	8 8	47.75	9.939	20 9	20.8	30.36	6 16.89	0.082	15 46.56	1 7.40	8 2
	24	8 12	45.99	9.915	19 57	2.1	31.20	6 18.57	0.068	15 46.65	1 7.32	8 6
	25	8 16	43.64	9.890	19 44	23.4	32.03	6 19.67	0.034	15 46.73	1 7.24	8 10
	26	8 20	40.71	9.866	+19 31	24.9	-32.84	+6 20.19	+0.010	15 46.83	1 7.15	8 14
	27	8 24	37.21	9.842	19 18	7.0	33.65	6 20.12	-0.015	15 46.92	1 7.07	8 18
	28	8 28	33.12	9.818	19 4	29.8	34.44	6 19.48	0.039	15 47.02	1 6.98	8 22
	29	8 32	28.44	9.793	18 50	33.7	35.23	6 18.26	0.063	15 47.12	1 6.90	8 26
	30	8 36	23.19	9.769	18 36	18.7	36.00	6 16.45	0.067	15 47.22	1 6.81	8 30
Aug.	31	8 40	17.35	9.745	+18 21	45.3	-36.76	+6 14.05	-0.112	15 47.33	1 6.72	8 34
	1	8 44	10.92	9.720	18 6	53.8	37.52	6 11.07	0.136	15 47.44	1 6.63	8 37
	2	8 48	3.89	9.695	17 51	44.5	38.26	6 7.50	0.161	15 47.57	1 6.55	8 41
	3	8 51	56.29	9.671	17 36	17.7	38.97	6 3.35	0.185	15 47.69	1 6.46	8 45
	4	8 55	48.07	9.646	17 20	33.6	39.69	5 58.60	0.210	15 47.82	1 6.37	8 49
	5	8 59	39.27	9.621	+17 4	32.6	-40.39	+5 53.25	-0.235	15 47.95	1 6.28	8 53
	6	9 3	29.87	9.596	16 48	15.1	41.07	5 47.31	0.260	15 48.09	1 6.20	8 57
	7	9 7	19.87	9.571	16 31	41.2	41.74	5 40.78	0.284	15 48.23	1 6.11	9 1
	8	9 11	9.27	9.546	16 14	51.3	42.40	5 33.65	0.309	15 48.38	1 6.03	9 5
	9	9 14	58.09	9.522	15 57	45.9	43.05	5 25.93	0.334	15 48.53	1 5.94	9 9
	10	9 18	46.31	9.497	+15 40	25.0	-43.68	+5 17.62	-0.358	15 48.69	1 5.86	9 13
	11	9 22	33.95	9.473	15 22	49.3	44.29	5 8.72	0.383	15 48.86	1 5.77	9 17
	12	9 26	21.00	9.449	15 4	58.9	44.90	4 59.24	0.407	15 49.03	1 5.69	9 21
	13	9 30	7.47	9.425	14 46	54.0	45.50	4 49.19	0.431	15 49.20	1 5.61	9 25
	14	9 33	53.37	9.401	14 28	35.1	46.07	4 38.57	0.454	15 49.37	1 5.53	9 29
	15	9 37	38.72	9.378	+14 10	2.5	-46.64	+4 27.39	-0.477	15 49.55	1 5.45	9 33
16	9 41	23.51	9.355	+13 51	16.5	-47.19	+4 15.65	-0.500	15 49.73	1 5.38	9 37	

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean-App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	" ' "	"	m s	s	' "	m s	h m s
16	9 41 23.51	9.355	+13 51 16.5	-47.19	+ 4 15.65	-0.500	15 49.73	1 5.38	9 37 7.15
17	9 45 7.75	9.332	13 32 17.2	47.74	4 3.38	0.523	15 49.91	1 5.30	9 41 3.70
18	9 48 51.46	9.311	13 13 5.4	48.26	3 50.57	0.544	15 50.10	1 5.23	9 45 0.26
19	9 52 34.66	9.290	12 53 40.9	48.77	3 37.26	0.565	15 50.29	1 5.15	9 48 56.81
20	9 56 17.35	9.269	12 34 4.2	49.28	3 23.43	0.586	15 50.48	1 5.09	9 52 53.37
21	9 59 59.56	9.249	+12 14 15.7	-49.76	+ 3 9.13	-0.606	15 50.68	1 5.02	9 56 49.92
22	10 3 41.30	9.230	11 54 15.5	50.24	2 54.35	0.625	15 50.87	1 4.95	10 0 46.48
23	10 7 22.57	9.211	11 34 3.9	50.71	2 39.11	0.644	15 51.07	1 4.89	10 4 43.03
24	10 11 3.42	9.193	11 13 41.3	51.17	2 23.45	0.662	15 51.27	1 4.82	10 8 39.58
25	10 14 43.85	9.177	10 53 7.9	51.60	2 7.37	0.679	15 51.47	1 4.76	10 12 36.14
26	10 18 23.89	9.161	+10 32 24.1	-52.04	+ 1 50.89	-0.694	15 51.68	1 4.70	10 16 32.69
27	10 22 3.54	9.145	10 11 30.2	52.45	1 34.04	0.710	15 51.88	1 4.64	10 20 29.24
28	10 25 42.82	9.130	9 50 26.4	52.86	1 16.81	0.726	15 52.09	1 4.58	10 24 25.80
29	10 29 21.75	9.115	9 29 13.1	53.24	0 59.24	0.739	15 52.30	1 4.53	10 28 22.35
30	10 33 0.35	9.102	9 7 50.5	53.62	0 41.34	0.753	15 52.52	1 4.48	10 32 18.90
31	10 36 38.63	9.088	+ 8 46 19.1	-53.99	+ 0 23.11	-0.766	15 52.74	1 4.43	10 36 15.46
t. 1	10 40 16.61	9.076	8 24 39.3	54.33	+ 0 4.58	0.778	15 52.96	1 4.38	10 40 12.01
2	10 43 54.29	9.064	8 2 51.4	54.66	- 0 14.24	0.790	15 53.18	1 4.34	10 44 8.56
3	10 47 31.69	9.053	7 40 55.5	54.98	0 33.34	0.801	15 53.40	1 4.30	10 48 5.12
4	10 51 8.83	9.043	7 18 52.2	55.28	0 52.70	0.812	15 53.64	1 4.26	10 52 1.67
5	10 54 45.72	9.032	+ 6 56 41.9	-55.57	- 1 12.31	-0.822	15 53.88	1 4.22	10 55 58.22
6	10 58 22.37	9.023	6 34 24.6	55.85	1 32.16	0.831	15 54.12	1 4.18	10 59 54.78
7	11 1 58.81	9.014	6 12 0.9	56.12	1 52.21	0.840	15 54.36	1 4.15	11 3 51.33
8	11 5 35.03	9.006	5 49 31.2	56.36	2 12.49	0.849	15 54.60	1 4.12	11 7 47.88
9	11 9 11.07	8.999	5 26 55.8	56.59	2 32.94	0.855	15 54.85	1 4.11	11 11 44.44
10	11 12 46.95	8.992	+ 5 4 14.9	-56.81	- 2 53.57	-0.862	15 55.10	1 4.09	11 15 40.99
11	11 16 22.67	8.986	4 41 28.9	57.01	3 14.34	0.868	15 55.36	1 4.07	11 19 37.54
12	11 19 58.25	8.980	4 18 38.1	57.21	3 35.26	0.874	15 55.61	1 4.05	11 23 34.09
13	11 23 33.71	8.975	3 55 43.0	57.38	3 56.29	0.879	15 55.88	1 4.04	11 27 30.65
14	11 27 9.07	8.971	3 32 43.8	57.54	4 17.43	0.883	15 56.14	1 4.03	11 31 27.20
15	11 30 44.34	8.969	+ 3 9 40.9	-57.69	- 4 38.65	-0.886	15 56.40	1 4.02	11 35 23.75
16	11 34 19.56	8.967	2 46 34.5	57.83	4 59.92	0.887	15 56.67	1 4.01	11 39 20.31
17	11 37 54.74	8.966	2 23 24.9	57.96	5 21.24	0.889	15 56.94	1 4.01	11 43 16.86
18	11 41 29.90	8.965	2 0 12.7	58.06	5 42.58	0.889	15 57.20	1 4.01	11 47 13.41
19	11 45 5.06	8.966	1 36 57.8	58.16	6 3.90	0.888	15 57.46	1 4.01	11 51 9.96
20	11 48 40.26	8.968	+ 1 13 40.8	-58.26	- 6 25.20	-0.887	15 57.73	1 4.02	11 55 6.52
21	11 52 15.52	8.971	0 50 21.9	58.32	6 46.43	0.883	15 57.99	1 4.03	11 59 3.07
22	11 55 50.86	8.975	0 27 1.4	58.38	7 7.59	0.880	15 58.25	1 4.04	12 2 59.62
23	11 59 26.31	8.980	+ 0 3 39.6	58.43	7 28.65	0.875	15 58.52	1 4.06	12 6 56.17
24	12 3 1.88	8.985	- 0 19 43.1	58.46	7 49.57	0.869	15 58.78	1 4.07	12 10 52.72
25	12 6 37.61	8.993	- 0 43 6.4	-58.47	- 8 10.32	-0.862	15 59.05	1 4.10	12 14 49.28
26	12 10 13.52	9.001	1 6 30.1	58.48	8 30.91	0.854	15 59.31	1 4.13	12 18 45.83
27	12 13 49.62	9.009	1 29 53.7	58.48	8 51.31	0.845	15 59.58	1 4.16	12 22 42.38
28	12 17 25.95	9.018	1 53 16.8	58.44	9 11.48	0.836	15 59.85	1 4.19	12 26 38.93
29	12 21 2.51	9.029	2 16 39.1	58.41	9 31.41	0.826	16 0.11	1 4.22	12 30 35.49
30	12 24 39.33	9.040	- 2 40 0.3	-58.35	- 9 51.09	-0.815	16 0.38	1 4.26	12 34 32.04
1	12 28 16.43	9.052	- 3 3 20.0	-58.28	-10 10.49	-0.802	16 0.65	1 4.30	12 38 28.59

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sk Tt Mean
	h m s	s	° ' "	"	m s	s	' "	m s	h
Oct. 1	12 28 16.43	9.052	— 3 3 20.0	—58.28	—10 10.49	—0.802	16 0.65	1 4.30	12 3
2	12 31 53.82	9.065	3 26 37.7	58.19	10 29.61	0.790	16 0.93	1 4.34	12 4
3	12 35 31.52	9.078	3 49 53.2	58.09	10 48.41	0.776	16 1.20	1 4.38	12 4
4	12 39 9.54	9.092	4 13 6.0	57.97	11 6.88	0.763	16 1.47	1 4.43	12 5
5	12 42 47.92	9.106	4 36 15.8	57.84	11 25.00	0.748	16 1.75	1 4.48	12 5
6	12 46 26.66	9.122	— 4 59 22.2	—57.69	—11 42.77	—0.733	16 2.03	1 4.54	12 5
7	12 50 5.77	9.138	5 22 24.9	57.52	12 0.17	0.716	16 2.31	1 4.60	13
8	12 53 45.28	9.155	5 45 23.4	57.34	12 17.16	0.699	16 2.59	1 4.66	13
9	12 57 25.21	9.173	6 8 17.4	57.15	12 33.75	0.682	16 2.87	1 4.72	13 1
10	13 1 5.56	9.191	6 31 6.4	56.93	12 49.90	0.664	16 3.15	1 4.79	13 1
11	13 4 46.36	9.210	— 6 53 50.3	—56.71	—13 5.61	—0.645	16 3.43	1 4.86	13 1
12	13 8 27.63	9.229	7 16 28.3	56.46	13 20.86	0.626	16 3.71	1 4.93	13 2
13	13 12 9.37	9.249	7 39 0.4	56.20	13 35.62	0.606	16 3.99	1 5.01	13 2
14	13 15 51.62	9.271	8 1 26.1	55.93	13 49.89	0.583	16 4.28	1 5.09	13 2
15	13 19 34.38	9.293	8 23 45.0	55.64	14 3.64	0.561	16 4.55	1 5.17	13 3
16	13 23 17.68	9.316	— 8 45 56.8	—55.33	—14 16.86	—0.539	16 4.83	1 5.25	13 3
17	13 27 1.54	9.339	9 8 1.0	55.01	14 29.51	0.516	16 5.11	1 5.34	13 4
18	13 30 45.98	9.364	9 29 57.4	54.68	14 41.59	0.491	16 5.39	1 5.42	13 4
19	13 34 31.01	9.390	9 51 45.5	54.32	14 53.09	0.466	16 5.66	1 5.51	13 4
20	13 38 16.66	9.416	10 13 24.9	53.96	15 3.96	0.439	16 5.93	1 5.60	13 5
21	13 42 2.96	9.443	—10 34 55.7	—53.58	—15 14.18	—0.412	16 6.20	1 5.70	13 5
22	13 45 49.92	9.471	10 56 17.0	53.18	15 23.75	0.384	16 6.46	1 5.79	14
23	13 49 37.57	9.500	11 17 28.6	52.77	15 32.64	0.356	16 6.73	1 5.89	14
24	13 53 25.92	9.529	11 38 30.0	52.35	15 40.81	0.326	16 6.98	1 5.99	14
25	13 57 15.00	9.560	11 59 21.0	51.90	15 48.28	0.296	16 7.23	1 6.09	14 1
26	14 1 4.80	9.591	—12 20 1.1	—51.44	—15 55.01	—0.265	16 7.50	1 6.20	14 1
27	14 4 55.34	9.622	12 40 29.9	50.96	16 0.99	0.233	16 7.75	1 6.30	14 2
28	14 8 46.66	9.654	13 0 47.0	50.46	16 6.21	0.202	16 8.00	1 6.41	14 2
29	14 12 38.75	9.687	13 20 51.9	49.95	16 10.66	0.169	16 8.25	1 6.52	14 2
30	14 16 31.62	9.719	13 40 44.3	49.41	16 14.35	0.137	16 8.50	1 6.63	14 3
31	14 20 25.28	9.752	—14 0 23.7	—48.86	—16 17.24	—0.104	16 8.75	1 6.74	14 3
Nov. 1	14 24 19.73	9.786	14 19 49.8	48.30	16 19.34	0.071	16 9.00	1 6.85	14 4
2	14 28 14.99	9.819	14 39 2.0	47.71	16 20.63	0.037	16 9.25	1 6.96	14 4
3	14 32 11.07	9.853	14 57 59.9	47.11	16 21.10	—0.003	16 9.49	1 7.09	14 4
4	14 36 7.95	9.887	15 16 43.3	46.50	16 20.78	+0.031	16 9.74	1 7.20	14 5
5	14 40 5.66	9.921	—15 35 11.6	—45.85	—16 19.62	+0.065	16 9.99	1 7.31	14 5
6	14 44 4.20	9.956	15 53 24.4	45.20	16 17.65	0.099	16 10.23	1 7.44	15
7	14 48 3.55	9.990	16 11 21.4	44.54	16 14.86	0.133	16 10.47	1 7.56	15
8	14 52 3.74	10.025	16 29 1.9	43.84	16 11.23	0.168	16 10.71	1 7.68	15
9	14 56 4.75	10.059	16 46 25.8	43.14	16 6.78	0.202	16 10.95	1 7.80	15 1
10	15 0 6.60	10.094	—17 3 32.6	—42.41	—16 1.50	+0.237	16 11.19	1 7.92	15 1
11	15 4 9.28	10.128	17 20 21.9	41.68	15 55.39	0.271	16 11.42	1 8.04	15 2
12	15 8 12.79	10.163	17 36 53.2	40.93	15 48.46	0.306	16 11.66	1 8.16	15 2
13	15 12 17.13	10.198	17 53 6.1	40.15	15 40.70	0.340	16 11.88	1 8.28	15 2
14	15 16 22.30	10.232	18 9 0.5	39.37	15 32.11	0.375	16 12.11	1 8.40	15 3
15	15 20 28.30	10.267	—18 24 35.8	—38.57	—15 22.68	+0.410	16 12.33	1 8.51	15 3
16	15 24 35.14	10.302	—18 39 51.5	—37.74	—15 12.43	+0.444	16 12.54	1 8.62	15 3

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean-App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ' "	"	m s	s	' "	m s	h m s
ov. 16	15 24 35.14	10.302	-18 39 51.5	-37.74	-15 12.43	+0.444	16 12.54	1 8.62	15 39 50.07
17	15 28 42.81	10.337	18 54 47.4	36.91	15 1.35	0.479	16 12.75	1 8.75	15 43 46.63
18	15 32 51.32	10.371	19 9 23.3	36.07	14 49.43	0.514	16 12.95	1 8.86	15 47 43.19
19	15 37 0.66	10.406	19 23 38.4	35.19	14 36.69	0.548	16 13.16	1 8.97	15 51 39.74
20	15 41 10.83	10.441	19 37 32.6	34.32	14 23.11	0.583	16 13.35	1 9.09	15 55 36.30
21	15 45 21.82	10.475	-19 51 5.6	-33.43	-14 8.70	+0.617	16 13.55	1 9.20	15 59 32.86
22	15 49 33.65	10.509	20 4 16.9	32.51	13 53.48	0.651	16 13.73	1 9.31	16 3 29.41
23	15 53 46.29	10.543	20 17 6.2	31.59	13 37.43	0.685	16 13.92	1 9.42	16 7 25.97
24	15 57 59.75	10.577	20 29 33.1	30.65	13 20.59	0.718	16 14.10	1 9.53	16 11 22.53
25	16 2 13.98	10.610	20 41 37.2	29.69	13 2.96	0.751	16 14.27	1 9.63	16 15 19.08
26	16 6 29.00	10.642	-20 53 18.3	-28.72	-12 44.54	+0.784	16 14.44	1 9.73	16 19 15.64
27	16 10 44.79	10.674	21 4 35.9	27.74	12 25.36	0.815	16 14.61	1 9.83	16 23 12.20
28	16 15 1.33	10.704	21 15 29.7	26.75	12 5.43	0.846	16 14.77	1 9.93	16 27 8.75
29	16 19 18.59	10.734	21 25 59.6	25.73	11 44.79	0.875	16 14.93	1 10.03	16 31 5.31
30	16 23 36.55	10.763	21 36 4.9	24.71	11 23.44	0.904	16 15.08	1 10.12	16 35 1.87
ec. 1	16 27 55.21	10.791	-21 45 45.7	-23.68	-11 1.40	+0.932	16 15.24	1 10.21	16 38 58.42
2	16 32 14.51	10.818	21 55 1.3	22.62	10 38.72	0.959	16 15.40	1 10.30	16 42 54.98
3	16 36 34.47	10.844	22 3 51.7	21.56	10 15.38	0.984	16 15.55	1 10.39	16 46 51.54
4	16 40 55.03	10.869	22 12 16.5	20.60	9 51.44	1.009	16 15.69	1 10.47	16 50 48.10
5	16 45 16.17	10.893	22 20 15.5	19.42	9 26.94	1.033	16 15.84	1 10.55	16 54 44.65
6	16 49 37.86	10.914	-22 27 48.4	-18.33	-9 1.87	+1.056	16 15.98	1 10.61	16 58 41.21
7	16 54 0.07	10.935	22 34 55.0	17.22	8 36.28	1.076	16 16.11	1 10.68	17 2 37.77
8	16 58 22.79	10.956	22 41 35.1	16.11	8 10.20	1.096	16 16.25	1 10.75	17 6 34.33
9	17 2 45.96	10.975	22 47 48.5	15.00	7 43.66	1.115	16 16.37	1 10.81	17 10 30.88
10	17 7 9.55	10.992	22 53 34.9	13.87	7 16.69	1.133	16 16.50	1 10.87	17 14 27.44
11	17 11 33.56	11.008	-22 58 54.2	-12.74	-6 49.32	+1.148	16 16.61	1 10.93	17 18 24.00
12	17 15 57.93	11.023	23 3 46.1	11.60	6 21.58	1.163	16 16.72	1 10.98	17 22 20.56
13	17 20 22.64	11.036	23 8 10.6	10.44	5 53.50	1.177	16 16.83	1 11.03	17 26 17.12
14	17 24 47.67	11.049	23 12 7.6	9.29	5 25.12	1.189	16 16.94	1 11.07	17 30 13.67
15	17 29 12.98	11.060	23 15 36.8	8.14	4 56.45	1.200	16 17.04	1 11.11	17 34 10.23
16	17 33 38.54	11.070	-23 18 38.2	-6.97	-4 27.53	+1.210	16 17.13	1 11.15	17 38 6.79
17	17 38 4.33	11.079	23 21 11.6	5.81	3 58.37	1.219	16 17.22	1 11.18	17 42 3.35
18	17 42 30.32	11.087	23 23 17.1	4.64	3 29.02	1.227	16 17.30	1 11.21	17 45 59.91
19	17 46 56.47	11.093	23 24 54.3	3.47	2 59.49	1.233	16 17.36	1 11.22	17 49 56.46
20	17 51 22.77	11.098	23 26 3.4	2.29	2 29.84	1.238	16 17.43	1 11.23	17 53 53.02
21	17 55 49.18	11.102	-23 26 44.1	-1.11	-2 0.06	+1.243	16 17.49	1 11.24	17 57 49.58
22	18 0 15.68	11.105	23 26 56.7	+0.07	1 30.21	1.244	16 17.55	1 11.25	18 1 46.14
23	18 4 42.23	11.106	23 26 40.8	1.26	1 0.31	1.246	16 17.60	1 11.25	18 5 42.70
24	18 9 8.78	11.106	23 25 56.7	2.43	0 30.39	1.246	16 17.64	1 11.25	18 9 39.25
25	18 13 35.30	11.104	23 24 44.3	3.61	-0 0.49	1.245	16 17.68	1 11.24	18 13 35.81
26	18 18 1.80	11.101	-23 23 3.6	+4.78	+0 29.35	+1.242	16 17.72	1 11.23	18 17 32.37
27	18 22 28.19	11.097	23 20 54.6	5.96	0 59.11	1.237	16 17.75	1 11.21	18 21 28.93
28	18 26 54.46	11.090	23 18 17.5	7.13	1 28.74	1.232	16 17.76	1 11.19	18 25 25.49
29	18 31 20.57	11.083	23 15 12.2	8.30	1 58.21	1.224	16 17.78	1 11.16	18 29 22.04
30	18 35 46.48	11.075	23 11 38.9	9.47	2 27.48	1.215	16 17.80	1 11.13	18 33 18.60
31	18 40 12.16	11.065	-23 7 37.7	+10.63	+2 56.52	+1.205	16 17.81	1 11.10	18 37 15.16

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
Jan. 0	U	h m	m	h m s	s	" "	"	s	" "	" "	
1	L	3 23.21	1.726	10 5 54.93	113.73	6 50 27.6	726.0	61.67	14 50.4	54 21.9	
1	U	15 43.76	1.700	10 28 29.70	112.17	4 23 55.8	738.2	61.26	14 48.6	54 15.4	II. S.
2	L	4 4.06	1.684	10 50 49.29	111.20	+ 1 55 34.3	744.4	61.03	14 47.5	54 11.3	
2	U	16 24.23	1.679	11 13 1.08	110.86	- 0 33 26.1	-744.8	60.97	14 47.0	54 9.6	II. S.
3	L	4 44.39	1.684	11 35 12.56	111.16	3 1 57.7	739.6	61.08	14 47.3	54 10.6	
3	U	17 4.68	1.699	11 57 31.34	112.08	5 28 54.5	728.9	61.35	14 48.3	54 14.2	II. S.
4	L	5 25.21	1.725	12 20 5.06	113.65	7 53 9.3	712.5	61.79	14 50.0	54 20.6	
4	U	17 46.12	1.761	12 43 1.35	115.84	-10 13 30.9	-690.0	62.40	14 52.5	54 29.8	II. S.
5	L	6 7.53	1.808	13 6 27.69	118.65	12 28 42.9	660.8	63.18	14 55.8	54 41.9	
5	U	18 29.56	1.865	13 30 31.27	122.05	14 37 20.4	624.1	64.10	14 59.8	54 56.6	II. S.
6	L	6 52.32	1.930	13 55 18.84	125.97	16 37 49.1	579.1	65.13	15 4.5	55 13.9	
6	U	19 15.91	2.002	14 20 56.25	130.34	-18 28 23.4	-524.9	66.27	15 9.9	55 33.6	II. S.
7	L	7 40.40	2.080	14 47 28.09	135.02	20 7 6.7	460.5	67.47	15 15.9	55 55.4	
7	U	20 5.84	2.160	15 14 57.14	139.84	21 31 52.8	385.3	68.67	15 22.3	56 19.1	II. S.
8	L	8 32.24	2.239	15 43 23.77	144.57	22 40 28.6	298.9	69.83	15 29.1	56 44.2	
8	U	20 59.56	2.312	16 12 45.50	148.96	-23 30 40.4	-201.4	70.89	15 36.3	57 10.3	II. S.
9	L	9 27.70	2.375	16 42 56.56	152.74	24 0 21.9	- 94.1	71.78	15 43.5	57 36.9	
9	U	21 56.50	2.423	17 13 47.96	155.65	24 7 44.3	+ 21.3	72.45	15 50.7	58 3.3	II. S.
10	L	10 25.78	2.454	17 45 7.98	157.49	23 51 27.2	142.0	72.87	15 57.7	58 28.9	
10	U	22 55.32	2.465	18 16 43.12	158.16	-23 10 48.0	+264.5	73.01	16 4.3	58 53.1	II. N.
11	L	11 24.87	2.457	18 48 19.41	157.69	22 5 48.7	384.7	72.88	16 10.3	59 15.2	
11	U	23 54.23	2.433	19 19 43.85	156.23	20 37 18.7	499.0	72.51	16 15.6	59 34.7	
12	L	12 23.21	2.396	19 50 45.71	153.98	18 46 52.2	603.7	71.96	16 20.1	59 51.0	
13	U	0 51.68	2.350	20 21 17.27	151.22	-16 36 41.5	+695.9	71.30	16 23.6	60 3.7	
13	L	13 19.59	2.301	20 51 14.24	148.26	14 9 29.0	773.6	70.58	16 26.0	60 12.7	
14	U	1 46.90	2.252	21 20 35.60	145.33	11 28 16.6	835.7	69.88	16 27.4	60 17.8	I. S.
14	L	14 13.64	2.207	21 49 23.19	142.67	8 36 16.8	881.5	69.24	16 27.7	60 19.0	
15	U	2 39.90	2.170	22 17 41.16	140.42	- 5 36 45.3	+911.0	68.70	16 27.0	60 16.5	I. S.
15	L	15 5.76	2.142	22 45 35.27	138.71	- 2 32 54.8	924.8	68.29	16 25.4	60 10.6	
16	U	3 31.34	2.123	23 13 12.41	137.59	+ 0 32 8.9	923.3	68.04	16 23.0	60 1.7	I. S.
16	L	15 56.76	2.115	23 40 39.94	137.11	3 35 28.7	907.6	67.94	16 19.8	59 50.2	
17	U	4 22.14	2.117	0 8 5.35	137.24	+ 6 34 17.6	+878.4	68.00	16 16.1	59 36.6	I. S.
17	L	16 47.61	2.129	0 35 35.78	137.93	9 25 58.4	836.4	68.20	16 12.0	59 21.3	
18	U	5 13.26	2.149	1 3 17.63	139.12	12 8 3.9	782.6	68.52	16 7.5	59 4.7	I. S.
18	L	17 39.19	2.175	1 31 16.14	140.70	14 38 15.7	717.6	68.93	16 2.7	58 47.3	
19	U	6 5.47	2.205	1 59 35.07	142.49	+16 54 25.2	+642.3	69.38	15 57.8	58 29.5	I. S.
19	L	18 32.11	2.236	2 28 16.28	144.37	18 54 34.8	557.7	69.84	15 52.9	58 11.5	
20	U	6 59.12	2.265	2 57 19.39	146.11	20 36 58.9	465.0	70.26	15 48.0	57 53.5	I. S.
20	L	19 26.44	2.288	3 26 41.72	147.54	22 0 8.3	365.6	70.59	15 43.2	57 35.7	
21	U	7 54.00	2.303	3 56 18.18	148.44	+23 2 53.1	+261.2	70.79	15 38.4	57 18.3	I. S.
21	L	20 21.68	2.307	4 26 1.58	148.67	23 44 26.0	154.0	70.82	15 33.8	57 1.3	
22	U	8 49.33	2.298	4 55 43.25	148.13	24 4 27.1	+ 46.3	70.65	15 29.3	56 44.8	I. S.
22	L	21 16.79	2.276	5 25 13.64	146.80	24 3 3.5	- 59.7	70.28	15 25.0	56 28.8	
23	U	9 43.90	2.241	5 54 23.35	144.70	+23 40 50.2	-161.6	69.72	15 20.7	56 13.3	I. N.S.

Jan. 23. U Defective Illumination of N. 0° 00.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Mer- idian.	Geo- cen- tric Semid- iameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
		h m	m	h m s	s	" ' "	"	s	" "	" "	
an. 23	U	9 43.90	2.241	5 54 23.35	144.70	+23 40 50.2	-161.6	69.72	15 20.7	56 13.3	I. N.S.
23	L	22 10.53	2.196	6 23 3.84	141.95	22 58 47.8	257.6	69.00	15 16.7	55 58.4	
24	U	10 36.56	2.142	6 51 8.19	138.70	21 58 18.0	346.0	68.15	15 12.8	55 44.0	I. N.S.
24	L	23 1.91	2.082	7 18 31.45	135.13	20 40 58.2	425.8	67.21	15 9.0	55 30.3	
25	U	11 26.53	2.020	7 45 10.77	131.42	+19 8 37.0	-496.2	66.23	15 5.4	55 17.1	I. N.S.
25	L	23 50.40	1.959	8 11 5.56	127.73	17 23 7.4	557.1	65.25	15 2.0	55 4.6	
26	U	12 13.56	1.901	8 36 16.98	124.21	15 26 23.7	608.6	64.31	14 58.8	54 52.9	I. II. S.
27	L	0 36.04	1.847	9 04 7.73	120.97	13 20 17.2	650.9	63.44	14 55.9	54 42.0	
27	U	12 57.91	1.799	9 24 41.80	118.11	+11 6 34.5	-684.7	62.67	14 53.2	54 32.2	II. S.
28	L	1 19.25	1.759	9 48 4.07	115.68	8 46 56.1	710.3	62.02	14 50.8	54 23.5	
28	U	13 40.15	1.727	10 11 0.06	113.74	6 22 55.2	728.5	61.51	14 48.8	54 16.1	II. S.
29	L	2 0.72	1.703	10 33 35.82	112.31	3 55 59.3	739.7	61.14	14 47.2	54 10.1	
29	U	14 21.06	1.688	10 55 57.64	111.42	+ 1 27 29.4	-744.3	60.91	14 46.0	54 5.8	II. S.
30	L	2 41.27	1.682	11 18 12.05	111.08	- 1 11 18.1	742.7	60.85	14 45.3	54 3.2	
30	U	15 1.47	1.686	11 40 25.77	111.31	3 29 10.4	735.1	60.95	14 45.1	54 2.6	II. S.
31	L	3 21.78	1.699	12 2 45.53	112.08	5 54 56.4	721.6	61.20	14 45.5	54 4.2	
31	U	15 42.29	1.722	12 25 18.15	113.44	- 8 17 25.5	-702.3	61.61	14 46.6	54 8.1	II. S.
eb. 1	L	4 3.14	1.754	12 48 10.42	115.36	10 35 25.4	676.8	62.18	14 48.3	54 14.3	
1	U	16 24.42	1.795	13 11 29.02	117.83	12 47 40.7	644.8	62.89	14 50.7	54 23.1	II. S.
2	L	4 46.24	1.844	13 35 20.39	120.82	14 52 51.2	605.8	63.73	14 53.8	54 34.6	
2	U	17 8.71	1.902	13 59 50.57	124.29	-16 49 29.8	-559.3	64.68	14 57.7	54 48.7	II. S.
3	L	5 31.92	1.966	14 25 4.90	128.16	18 36 1.6	504.6	65.73	15 2.3	55 5.4	
3	U	17 55.93	2.036	14 51 7.70	132.35	20 10 44.4	441.0	66.83	15 7.5	55 24.7	II. S.
4	L	6 20.79	2.108	15 18 1.91	136.71	21 31 47.8	368.0	67.95	15 13.4	55 46.5	
4	U	18 46.52	2.181	15 45 48.59	141.06	-22 37 16.7	-285.2	69.05	15 20.0	56 10.7	II. S.
5	L	7 13.11	2.250	16 14 26.53	145.21	23 25 13.8	192.7	70.08	15 27.2	56 36.9	
5	U	19 40.49	2.312	16 43 51.99	148.94	23 53 45.5	- 91.2	70.98	15 34.8	57 4.8	II. S.
6	L	8 8.55	2.363	17 13 58.59	152.04	24 1 10.3	+ 18.3	71.71	15 42.7	57 33.9	
6	U	20 37.15	2.401	17 44 37.57	154.32	-23 46 5.1	+133.5	72.23	15 50.8	58 3.7	II. S.
7	L	9 6.12	2.423	18 15 38.42	155.67	23 7 35.1	251.8	72.52	15 59.0	58 33.6	
7	U	21 35.25	2.430	18 46 49.77	156.06	22 5 21.7	370.1	72.58	16 6.9	59 2.8	II. N.
8	L	10 4.38	2.422	19 18 0.54	155.59	20 39 45.4	485.0	72.43	16 14.5	59 30.6	
8	U	22 33.34	2.402	19 49 0.97	154.38	-18 51 48.7	+592.9	72.11	16 21.5	59 56.2	II. N.
9	L	11 2.00	2.373	20 19 43.49	152.64	16 43 15.3	690.7	71.66	16 27.6	60 18.7	
9	U	23 30.28	2.339	20 50 3.13	150.61	14 16 23.6	775.6	71.15	16 32.7	60 37.5	
10	L	11 58.14	2.304	21 19 57.76	148.50	11 34 2.4	845.3	70.62	16 36.7	60 52.0	
11	U	0 25.60	2.272	21 49 27.85	146.54	- 8 39 22.4	+898.5	70.13	16 39.3	61 1.7	
11	L	12 52.69	2.244	22 18 36.00	144.88	5 35 48.9	934.2	69.72	16 40.6	61 6.4	
12	U	1 19.48	2.223	22 47 26.52	143.62	- 2 26 54.0	951.9	69.42	16 40.5	61 6.0	I. S.
12	L	13 46.08	2.210	23 16 4.86	142.85	+ 0 43 48.8	952.1	69.25	16 39.0	61 0.6	
13	U	2 12.57	2.206	23 44 36.96	142.59	+ 3 52 50.1	+935.3	69.21	16 36.3	60 50.7	I. S.
13	L	14 39.06	2.210	0 13 8.90	142.82	6 56 49.9	902.0	69.30	16 32.5	60 36.6	
14	U	3 5.64	2.221	0 41 46.33	143.49	9 52 39.7	853.7	69.50	16 27.6	60 18.9	I. S.
14	L	15 32.39	2.238	1 10 33.97	144.50	12 37 25.8	791.7	69.78	16 22.0	59 58.3	
15	U	3 59.37	2.259	1 39 35.31	144.75	+15 8 31.6	+717.3	70.12	16 15.8	59 35.5	I. S.

Jan. 23, U Defective Illumination of N. 0°.00.
Jan. 24, U Defective Illumination of S. 0°.06.

Jan. 26, U Defective Illumination of N. 0°.00.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Me- ridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
Feb. 15	U	h m	m	h m s	s	" ' "	"	s	" "	" "	I. S.
15	L	3 59.37	2.250	1 39 35.31	145.75	+15 8 31.6	+717.3	70.12	16 15.8	59 35.5	I. S.
16	U	16 26.60	2.280	2 8 52.16	147.06	17 23 38.6	632.3	70.48	16 9.2	59 11.3	I. S.
16	L	4 54.09	2.301	2 38 24.34	148.27	19 20 48.9	538.2	70.80	16 2.4	58 46.1	I. S.
16	L	17 21.80	2.316	3 8 9.57	149.20	20 58 26.8	437.1	71.05	15 55.5	58 20.7	I. S.
17	U	5 49.65	2.324	3 38 3.49	149.69	+22 15 20.9	+331.2	71.17	15 48.6	57 55.5	I. S.
17	L	18 17.54	2.323	4 7 59.86	149.59	23 10 46.7	222.8	71.14	15 41.9	57 30.9	I. S.
18	U	6 45.35	2.310	4 37 51.10	148.82	23 44 25.9	113.9	70.94	15 35.4	57 7.2	I. S.
18	L	19 12.93	2.285	5 7 28.85	147.35	23 56 27.4	+ 6.8	70.56	15 29.3	56 44.7	I. N.S.
19	U	7 40.15	2.250	5 36 44.88	145.22	+23 47 26.3	- 96.3	70.00	15 23.5	56 23.6	I. N.S.
19	L	20 6.89	2.205	6 5 31.67	142.50	23 18 19.2	193.8	69.29	15 18.2	56 4.0	I. N.S.
20	U	8 33.03	2.152	6 33 43.02	139.33	22 30 22.1	284.4	68.46	15 13.3	55 45.9	I. N.S.
20	L	20 58.51	2.096	7 1 14.49	135.88	21 25 4.8	367.2	67.53	15 8.7	55 29.3	I. N.
21	U	9 23.29	2.035	7 28 3.52	132.28	+20 4 5.9	-441.3	66.56	15 4.6	55 14.2	I. N.
21	L	21 47.35	1.975	7 54 9.41	128.70	18 29 9.3	506.7	65.59	15 0.9	55 0.5	I. N.
22	U	10 10.71	1.918	8 19 33.10	125.27	16 42 0.0	563.4	64.65	14 57.6	54 48.3	I. N.S.
22	L	22 33.41	1.865	8 44 16.95	122.09	14 44 22.1	611.5	63.76	14 54.6	54 37.5	I. N.S.
23	U	10 55.50	1.818	9 8 24.46	119.23	+12 37 56.8	-651.4	62.96	14 52.0	54 28.0	I. N.S.
23	L	23 17.07	1.777	9 31 59.98	116.76	10 24 20.8	683.3	62.27	14 49.8	54 19.7	I. N.S.
24	U	11 38.18	1.743	9 55 8.47	114.73	8 5 6.9	707.8	61.70	14 47.9	54 12.7	I. N.S.
24	L	23 58.93	1.717	10 17 55.32	113.16	5 41 43.3	725.0	61.25	14 46.3	54 7.0	I. N.S.
25	U	12 19.42	1.699	10 40 26.25	112.07	+ 3 15 34.1	-735.4	60.94	14 45.1	54 2.6	I. II. S.
26	L	0 39.74	1.689	11 2 47.08	111.48	+ 0 48 0.3	739.2	60.78	14 44.3	53 59.5	II. S.
26	U	12 59.99	1.688	11 25 3.80	111.39	- 1 39 40.0	736.5	60.77	14 43.8	53 57.7	II. S.
27	L	1 20.27	1.694	11 47 22.42	111.80	4 6 10.2	727.4	60.90	14 43.7	53 57.4	II. S.
27	U	13 40.69	1.709	12 9 48.90	112.70	- 6 30 14.2	-712.1	61.17	14 44.0	53 58.6	II. S.
28	L	2 1.33	1.732	12 32 29.18	114.09	8 50 36.3	690.5	61.59	14 44.8	54 1.5	II. S.
28	U	14 22.30	1.763	12 55 29.04	115.96	11 5 58.8	662.2	62.14	14 46.1	54 6.2	II. S.
Mar. 1	L	2 43.69	1.803	13 18 54.06	118.28	13 15 2.4	627.2	62.81	14 47.9	54 12.7	II. S.
1	U	15 5.58	1.848	13 42 49.43	121.02	-15 16 23.8	-585.1	63.59	14 50.2	54 21.3	II. S.
2	L	3 28.06	1.899	14 7 19.87	124.12	17 8 36.7	535.8	64.46	14 53.1	54 31.9	II. S.
2	U	15 51.18	1.956	14 32 29.34	127.51	18 50 10.4	478.5	65.39	14 56.6	54 44.8	II. S.
3	L	4 15.00	2.015	14 58 20.81	131.10	20 19 30.3	413.4	66.37	15 0.8	55 0.0	II. S.
3	U	16 39.55	2.076	15 24 55.98	134.77	-21 34 58.8	-340.0	67.35	15 5.5	55 17.4	II. S.
4	L	5 4.82	2.136	15 52 15.01	138.38	22 34 57.2	258.4	68.30	15 10.9	55 37.2	II. S.
4	U	17 30.80	2.193	16 20 16.26	141.78	23 17 49.1	168.9	69.17	15 16.9	55 59.2	II. S.
5	L	5 57.42	2.243	16 48 56.26	144.81	23 42 3.4	- 72.3	69.94	15 23.5	56 23.4	II. S.
5	U	18 24.60	2.285	17 18 9.68	147.33	-23 46 20.4	+ 30.4	70.57	15 30.6	56 49.5	II. S.
6	L	6 52.22	2.317	17 47 49.66	149.23	23 29 35.6	137.7	71.03	15 38.2	57 17.3	II. N.
6	U	19 20.15	2.337	18 17 48.34	150.44	22 51 6.3	247.5	71.31	15 46.1	57 46.4	II. N.
7	L	7 48.26	2.345	18 47 57.45	150.97	21 50 35.7	357.5	71.41	15 54.3	58 16.4	II. N.
7	U	20 16.40	2.344	19 18 9.11	150.88	-20 28 15.6	+465.3	71.36	16 2.5	58 46.5	II. N.
8	L	8 44.48	2.334	19 48 16.60	150.29	18 44 49.5	568.0	71.18	16 10.6	59 16.2	II. N.
8	U	21 12.40	2.319	20 18 14.77	149.36	16 41 31.6	663.4	70.91	16 18.3	59 44.7	II. N.
9	L	9 40.11	2.300	20 48 0.48	148.25	14 20 7.1	748.8	70.60	16 25.5	60 11.2	II. N.
9	U	22 7.60	2.282	21 17 32.68	147.14	-11 42 49.3	+822.0	70.30	16 32.0	60 34.9	II. N.

Feb. 19, U Defective Illumination of N. 0'.52.

Feb. 20, U Defective Illumination of S. 0'.54.

Feb. 23, U Defective Illumination of S. 0'.32.

Feb. 24, U Defective Illumination of N. 0'.35.

Feb. 25, U Defective Illumination of I. 0'.02.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- diam. Pass- ing Mer- idian.	Geo- cen- ter Semi- diam- eter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
		h m	m	h m s	s	" ' "	"	s	" "	" "	
ar. 9	U	22 7.60	2.282	21 17 32.68	147.14	-11 42 49.3	+822.0	70.30	16 32.0	60 34.9	II. N.
10	L	10 34.89	2.266	21 46 52.34	146.18	8 52 16.3	881.0	70.04	16 37.5	60 54.9	
10	U	23 2.00	2.255	22 16 2.14	145.51	5 51 28.8	924.2	69.84	16 41.7	61 10.5	II. N.
11	L	11 29.02	2.250	22 45 6.04	145.21	- 2 43 44.7	950.2	69.75	16 44.6	61 21.2	
11	U	23 56.03	2.252	23 14 8.97	145.35	+ 0 27 25.1	+958.4	69.78	16 46.1	61 26.5	
12	L	12 23.10	2.262	23 43 16.24	145.94	3 38 21.8	948.0	69.93	16 46.0	61 26.3	
13	U	0 50.34	2.278	0 12 33.03	146.93	6 45 24.6	919.4	70.18	16 44.4	61 20.5	
13	L	13 17.81	2.300	0 42 3.91	148.26	9 44 56.4	873.0	70.53	16 41.4	61 9.4	
14	U	1 45.57	2.326	1 11 52.26	149.82	+12 33 29.5	+809.8	70.94	16 37.1	60 53.5	I. S.
14	L	14 13.64	2.353	1 41 59.83	151.44	15 7 53.0	731.7	71.36	16 31.6	60 33.3	
15	U	2 42.04	2.378	2 12 26.30	152.93	17 25 17.2	640.4	71.76	16 25.1	60 9.6	I. S.
15	L	15 10.70	2.398	2 43 8.96	154.10	19 23 20.2	538.5	72.08	16 18.0	59 43.3	
16	U	3 39.54	2.409	3 14 2.71	154.75	+21 0 12.0	+429.0	72.27	16 10.3	59 15.0	I. S.
16	L	16 8.45	2.408	3 45 0.30	154.72	22 14 38.1	314.8	72.29	16 2.3	58 45.7	
17	U	4 37.28	2.394	4 15 52.83	153.90	23 6 1.0	199.0	72.11	15 54.2	58 16.0	I. S.
17	L	17 5.86	2.367	4 46 30.56	152.25	23 34 19.7	+ 84.6	71.73	15 46.2	57 46.7	
18	U	5 34.03	2.327	5 16 43.81	149.83	+23 40 7.1	- 25.8	71.15	15 38.4	57 18.2	I. S.
18	L	18 1.65	2.275	5 46 23.84	146.74	23 24 24.6	130.1	70.39	15 31.0	56 51.0	
19	U	6 28.60	2.215	6 15 23.53	143.14	22 48 35.8	226.6	69.48	15 24.0	56 25.4	I. N.S.
19	L	18 54.79	2.150	6 43 37.91	139.22	21 54 19.8	314.5	68.48	15 17.6	56 1.7	
20	U	7 20.19	2.083	7 11 4.21	135.16	+20 43 24.7	-393.2	67.42	15 11.7	55 40.0	I. N.
20	L	19 44.78	2.016	7 37 41.82	131.13	19 17 41.6	462.5	66.35	15 6.4	55 20.5	
21	U	8 8.58	1.952	8 3 32.05	127.28	17 39 0.4	522.8	65.30	15 1.6	55 3.2	I. N.
21	L	20 31.64	1.893	8 28 37.70	123.72	15 49 7.6	574.5	64.32	14 57.5	54 48.1	
22	U	8 54.03	1.840	8 53 2.82	120.54	+13 49 44.3	-618.1	63.43	14 54.0	54 35.1	I. N.
22	L	21 15.82	1.794	9 16 52.29	117.78	11 42 25.6	653.8	62.64	14 51.0	54 24.2	
23	U	9 37.11	1.756	9 40 11.55	115.51	9 28 40.8	682.4	61.98	14 48.5	54 15.2	I. N.
23	L	21 58.00	1.726	10 3 6.43	113.73	7 9 54.6	704.1	61.45	14 46.6	54 8.1	
24	U	10 18.58	1.705	10 25 42.92	112.45	+ 4 47 27.3	-719.3	61.06	14 45.1	54 2.7	I. N.
24	L	22 38.96	1.692	10 48 7.15	111.68	+ 2 22 36.5	728.1	60.82	14 44.1	53 59.0	
25	U	10 59.23	1.688	11 10 25.22	111.42	- 0 3 22.0	730.6	60.73	14 43.6	53 56.9	I. N.S.
25	L	23 19.50	1.692	11 32 43.16	111.66	2 29 12.6	726.8	60.78	14 43.4	53 56.3	
26	U	11 39.87	1.704	11 55 6.93	112.39	- 4 53 39.6	-716.6	60.97	14 43.6	53 57.2	I. S.
27	L	0 0.43	1.724	12 17 42.30	113.58	7 15 26.1	699.9	61.30	14 44.2	53 59.4	
27	U	12 21.28	1.751	12 40 34.83	115.23	9 33 12.7	676.6	61.76	14 45.2	54 3.0	II. S.
28	L	0 42.50	1.786	13 3 49.75	117.32	11 45 37.3	646.3	62.34	14 46.6	54 7.9	
28	U	13 4.17	1.827	13 27 31.87	119.76	-13 51 14.6	-608.7	63.02	14 48.3	54 14.2	II. S.
29	L	1 26.37	1.873	13 51 45.42	122.54	15 48 36.2	563.7	63.79	14 50.4	54 21.9	
29	U	13 49.14	1.923	14 16 33.85	125.87	17 36 10.6	510.8	64.63	14 52.9	54 31.1	II. S.
30	L	2 12.53	1.976	14 41 59.68	128.76	19 12 24.1	450.1	65.50	14 55.8	54 41.7	
30	U	14 36.57	2.030	15 8 4.16	131.99	-20 35 42.2	-381.6	66.38	14 59.1	54 53.9	II. S.
31	L	3 1.25	2.083	15 34 47.20	135.16	21 44 31.8	305.4	67.24	15 2.9	55 7.8	
31	U	15 26.54	2.132	16 2 7.12	138.12	22 37 23.3	222.0	68.03	15 7.1	55 23.3	II. S.
pr. 1	L	3 52.39	2.175	16 30 0.65	140.73	23 12 54.9	132.2	68.73	15 11.8	55 40.5	
1	U	16 18.72	2.211	16 58 23.00	142.91	-23 29 55.0	- 37.0	69.31	15 17.0	55 59.4	II. S.

Mar. 19, U Defective Illumination of S. 0° 30.

Mar. 25, U Defective Illumination of S. 0° 15.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- Pass- ing Me- ridian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
Apr. 1	U	h m	m	h m s	s	" ' "	"	s	" "	" "	II. S.
2	L	4 45.43	2.238	17 27 8.20	144.52	23 27 27.0	+ 62.2	69.74	15 22.6	56 20.1	
2	U	17 12.40	2.256	17 56 9.43	145.57	23 4 51.8	163.9	70.01	15 28.6	56 42.3	II. N.S.
3	L	5 39.53	2.263	18 25 19.66	146.04	22 21 50.7	266.2	70.14	15 35.1	57 6.0	
3	U	18 6.69	2.262	18 54 32.21	145.97	-21 18 27.6	+367.3	70.13	15 41.9	57 31.0	II. N.
4	L	6 33.80	2.254	19 23 41.39	145.49	19 55 8.4	465.2	70.01	15 49.0	57 57.0	
4	U	19 0.78	2.242	19 52 42.94	144.72	18 12 41.7	558.2	69.81	15 56.2	58 23.6	II. N.
5	L	7 27.59	2.227	20 21 34.31	143.82	16 12 17.6	644.5	69.55	16 3.5	58 50.3	
5	U	19 54.22	2.212	20 50 14.84	142.95	-13 55 26.3	+722.5	69.32	16 10.7	59 16.6	II. N.
6	L	8 20.69	2.200	21 18 45.67	142.23	11 23 58.0	790.4	69.11	16 17.6	59 42.0	
6	U	20 47.05	2.193	21 47 9.59	141.81	8 40 0.7	847.0	68.97	16 24.0	60 5.6	II. N.
7	L	9 13.36	2.193	22 15 30.74	141.79	5 46 1.6	890.6	68.93	16 29.8	60 26.8	
7	U	21 39.71	2.200	22 43 54.34	142.23	- 2 44 44.3	+919.8	69.01	16 34.7	60 44.9	II. N.
8	L	10 6.20	2.216	23 12 26.22	143.18	+ 0 20 50.6	933.3	69.22	16 38.6	60 59.1	
8	U	22 32.92	2.240	23 41 12.50	144.62	3 27 27.7	930.0	69.56	16 41.3	61 8.9	II. N.
9	L	10 59.99	2.272	0 10 18.99	146.53	6 31 40.0	909.0	70.02	16 42.6	61 13.8	
9	U	23 27.47	2.310	0 39 50.76	148.81	+ 9 29 52.6	+870.0	70.57	16 42.6	61 13.6	
10	L	11 55.43	2.352	1 9 51.43	151.33	12 18 28.3	813.0	71.18	16 41.1	61 8.1	
11	U	0 23.90	2.394	1 40 22.67	153.87	14 53 55.9	738.9	71.80	16 38.2	60 57.4	
11	L	12 52.87	2.433	2 11 23.54	156.22	17 12 58.3	649.1	72.38	16 34.0	60 42.0	
12	U	1 22.26	2.464	2 42 50.17	158.12	+19 12 41.3	+546.1	72.86	16 28.6	60 22.3	I. S.
12	L	13 51.96	2.484	3 14 35.60	159.32	20 50 44.4	433.0	73.17	16 22.2	59 58.9	
13	U	2 21.82	2.489	3 46 30.01	159.59	22 5 27.3	313.4	73.27	16 15.1	59 32.7	I. S.
13	L	14 51.62	2.476	4 18 21.56	158.82	22 55 55.9	191.2	73.12	16 7.4	59 4.4	
14	U	3 21.17	2.445	4 49 57.38	156.98	+23 22 2.9	+ 70.4	72.71	15 59.3	58 34.8	I. S.
14	L	15 50.25	2.398	5 21 4.99	154.14	23 24 25.8	- 45.5	72.05	15 51.1	58 4.7	
15	U	4 18.67	2.337	5 51 33.34	150.47	23 4 18.7	154.2	71.18	15 42.9	57 34.8	I. S.
15	L	16 46.30	2.266	6 21 13.87	146.21	22 23 24.3	253.2	70.15	15 35.0	57 5.8	
16	U	5 13.04	2.190	6 50 0.89	141.59	+21 23 42.8	-341.9	69.02	15 27.5	56 38.0	I. N.
16	L	17 38.84	2.111	7 17 51.72	136.88	20 7 23.0	419.6	67.83	15 20.4	56 11.9	
17	U	6 3.71	2.035	7 44 46.38	132.27	18 36 34.2	486.8	66.64	15 13.8	55 47.9	I. N.
17	L	18 27.69	1.962	8 10 47.17	127.92	16 53 20.9	543.8	65.50	15 7.9	55 26.2	
18	U	6 50.84	1.897	8 35 58.09	123.97	+14 59 39.6	-591.5	64.44	15 2.6	55 6.9	I. N.
18	L	19 13.24	1.839	9 0 24.44	120.51	12 57 16.8	630.9	63.49	14 58.1	54 50.1	
19	U	7 35.01	1.790	9 24 12.32	117.57	10 47 49.6	662.4	62.67	14 54.2	54 35.8	I. N.
19	L	19 56.25	1.751	9 47 28.32	115.20	8 32 46.4	687.0	61.99	14 51.0	54 24.1	
20	U	8 17.07	1.721	10 10 19.29	113.41	+ 6 13 28.6	-704.9	61.46	14 48.5	54 14.9	I. N.
20	L	20 37.59	1.701	10 32 52.20	112.18	3 51 11.1	716.9	61.08	14 46.6	54 8.0	
21	U	8 57.93	1.690	10 55 13.93	111.54	+ 1 27 6.4	722.9	60.87	14 45.3	54 3.4	I. N.
21	L	21 18.19	1.689	11 17 31.30	111.45	- 0 57 35.8	723.1	60.81	14 44.7	54 1.0	
22	U	9 38.49	1.696	11 39 50.96	111.92	- 3 21 45.2	-717.4	60.91	14 44.6	54 0.6	I. N.
22	L	21 58.94	1.713	12 2 19.36	112.90	5 44 10.0	705.7	61.16	14 45.0	54 2.1	
23	U	10 19.63	1.738	12 25 2.67	114.39	8 3 36.0	687.6	61.54	14 45.9	54 5.3	I. N.
23	L	22 40.67	1.770	12 48 6.74	116.36	10 18 44.4	662.7	62.06	14 47.2	54 10.1	
24	U	11 2.14	1.809	13 11 36.91	118.74	-12 28 12.1	-630.7	62.69	14 48.8	54 16.3	I. N.S.

Apr. 2, U Defective Illumination of N. & S.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- d. Pass- ing Mer- idian.	Geocen- tric Semi-di- ameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
		h m	m	h m s	s	" " "	" "	s	" "	" "	
Apr. 24	U	11 2.14	1.809	13 11 36.91	118.74	-12 28 12.1	-630.7	62.69	14 48.8	54 16.3	I. N.S.
24	L	23 24.13	1.805	13 35 37.95	121.49	14 30 30.5	591.1	63.42	14 50.9	54 23.9	
25	U	11 46.69	1.906	14 0 13.80	124.52	16 24 6.6	543.5	64.23	14 53.3	54 32.8	I. II. S.
26	L	0 9.88	1.960	14 25 27.35	127.75	18 7 23.0	487.8	65.08	14 56.0	54 42.7	
26	U	12 33.73	2.014	14 51 20.23	131.06	-19 38 40.2	-423.7	65.95	14 59.0	54 53.7	II. S.
27	L	0 58.23	2.068	15 17 52.47	134.30	20 56 18.6	351.4	66.81	15 2.3	55 5.6	
27	U	13 23.35	2.119	15 45 2.44	137.32	21 58 42.0	271.3	67.61	15 5.8	55 18.5	II. S.
28	L	1 49.05	2.163	16 12 46.63	139.98	22 44 22.3	184.3	68.31	15 9.6	55 32.3	
28	U	14 15.22	2.199	16 40 59.86	142.14	-23 12 2.5	-91.5	68.88	15 13.6	55 47.0	II. S.
29	L	2 41.77	2.225	17 9 35.48	143.70	23 20 42.2	+ 5.5	69.30	15 17.8	56 2.6	
29	U	15 8.57	2.239	17 38 25.88	144.60	23 9 40.8	105.0	69.56	15 22.3	56 19.0	II. N.S.
30	L	3 35.48	2.243	18 7 23.08	144.83	22 38 40.2	205.0	69.65	15 27.0	56 36.3	
30	U	16 2.37	2.237	18 36 19.46	144.47	-21 47 45.8	+303.6	69.59	15 31.9	56 54.4	II. N.
May 1	L	4 29.14	2.223	19 5 8.43	143.62	20 37 25.8	399.0	69.41	15 37.1	57 13.3	
1	U	16 55.71	2.203	19 33 44.91	142.42	19 8 29.3	489.4	69.13	15 42.4	57 32.8	II. N.
2	L	5 22.01	2.180	20 2 5.79	141.04	17 22 4.3	573.6	68.80	15 47.9	57 52.9	
2	U	17 48.04	2.157	20 30 9.91	139.65	-15 19 34.6	+650.0	68.46	15 53.4	58 13.3	II. N.
3	L	6 13.80	2.137	20 57 58.14	138.42	13 2 37.6	717.9	68.15	15 59.0	58 33.7	
3	U	18 39.34	2.121	21 25 33.21	137.49	10 33 2.1	776.4	67.90	16 4.5	58 54.0	II. N.
4	L	7 4.74	2.112	21 52 59.39	136.95	7 52 47.4	824.3	67.76	16 9.9	59 13.7	
4	U	19 30.08	2.112	22 20 22.21	136.94	- 5 4 3.6	+861.0	67.74	16 15.0	59 32.3	II. N.
5	L	7 55.47	2.122	22 47 48.16	137.49	- 2 9 11.5	885.5	67.86	16 19.7	59 49.5	
5	U	20 21.03	2.141	23 15 24.28	138.64	+ 0 49 16.3	896.8	68.12	16 23.8	60 4.7	II. N.
6	L	8 46.88	2.170	23 43 17.83	140.39	3 48 34.9	893.8	68.53	16 27.2	60 17.3	
6	U	21 13.14	2.208	0 11 35.82	142.70	+ 6 45 47.1	+875.6	69.08	16 29.8	60 26.8	II. N.
7	L	9 39.91	2.254	0 40 24.53	145.49	9 37 44.7	841.2	69.75	16 31.5	60 32.9	
7	U	22 7.27	2.306	1 9 48.94	148.62	12 21 11.1	790.3	70.50	16 32.1	60 35.1	II. N.
8	L	10 35.27	2.361	1 39 52.07	151.91	14 52 46.3	722.8	71.29	16 31.6	60 33.2	
8	U	23 3.92	2.414	2 10 34.20	155.08	+17 9 13.6	+639.2	72.04	16 29.9	60 27.0	
9	L	11 33.18	2.460	2 41 52.47	157.87	19 7 29.9	541.2	72.70	16 27.0	60 16.6	
10	U	0 2.92	2.495	3 13 40.35	159.97	20 44 55.3	431.3	73.20	16 23.1	60 2.2	
10	L	12 32.99	2.514	3 45 47.87	161.10	21 59 25.7	312.6	73.48	16 18.2	59 44.2	
11	U	1 3.18	2.513	4 18 2.21	161.07	+22 49 40.7	+189.4	73.48	16 12.4	59 23.0	I. S.
11	L	13 33.23	2.492	4 50 8.72	159.79	23 15 10.2	+ 65.8	73.20	16 6.0	58 59.3	
12	U	2 2.91	2.451	5 21 52.55	157.31	23 16 14.5	- 54.1	72.64	15 59.0	58 33.7	I. S.
12	L	14 31.99	2.392	5 53 0.13	153.79	22 53 59.7	166.8	71.82	15 51.7	58 6.8	
13	U	3 0.28	2.321	6 23 20.38	149.48	+22 10 8.6	-269.8	70.79	15 44.2	57 39.4	I. N.
13	L	15 27.65	2.241	6 52 45.55	144.67	21 6 49.2	361.4	69.63	15 36.8	57 12.1	
14	U	3 54.04	2.157	7 21 11.43	139.64	19 46 22.4	441.1	68.40	15 29.5	56 45.4	I. N.
14	L	16 19.42	2.075	7 48 37.06	134.67	18 11 12.3	508.7	67.16	15 22.5	56 19.9	
15	U	4 43.84	1.996	8 15 4.29	129.94	+16 23 38.2	-565.1	65.95	15 16.0	55 56.0	I. N.
15	L	17 7.35	1.924	8 40 37.11	125.51	14 25 50.2	611.1	64.83	15 10.0	55 34.0	
16	U	5 30.05	1.861	9 5 21.07	121.80	12 19 46.4	647.9	63.82	15 4.6	55 14.2	I. N.
16	L	17 52.04	1.807	9 29 22.70	118.57	10 7 12.5	676.4	62.95	14 59.9	54 56.9	
17	U	6 13.45	1.763	9 52 49.15	115.95	+ 7 49 42.3	-697.5	62.23	14 55.9	54 42.1	I. N.

Apr. 25, U Defective Illumination of II. 0.06.

Apr. 28, U Defective Illumination of N. 0.48.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	*Var. per Hour of Long.	S. T. of Semi- d. Pass- ing Me- ridian.	Geocen- tric Semi-di- ameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
May 17	U	h m	m	h m s	s	" "	"	s	" "	" "	I. N.
17	L	18 34.40	1.730	10 15 47.90	113.95	5 28 39.8	711.9	61.67	14 52.6	54 30.0	I. N.
18	U	6 55.02	1.708	10 38 26.53	112.59	3 52 21.2	720.2	61.28	14 50.0	54 20.6	I. N.
18	L	19 15.43	1.695	11 05 52.61	111.86	+ 0 40 56.7	723.0	61.06	14 48.2	54 13.9	I. N.
19	U	7 35.75	1.693	11 23 13.59	111.74	- 1 43 26.7	-720.0	61.00	14 47.1	54 9.8	I. N.
19	L	19 56.11	1.701	11 45 36.76	112.23	4 6 42.4	711.6	61.11	14 46.7	54 8.3	I. N.
20	U	8 16.63	1.719	12 8 9.24	113.29	6 27 43.9	697.6	61.38	14 46.9	54 9.2	I. N.
20	L	20 37.41	1.746	12 30 57.79	114.90	8 45 20.8	677.5	61.80	14 47.8	54 12.4	I. N.
21	U	8 58.56	1.781	12 54 8.88	117.03	-10 58 18.5	-651.0	62.35	14 49.2	54 17.7	I. N.
21	L	21 20.19	1.825	13 17 48.43	119.63	13 5 16.4	617.4	63.03	14 51.3	54 25.1	I. N.
22	U	9 42.38	1.875	13 42 1.74	122.65	15 4 47.1	576.4	63.81	14 53.7	54 34.2	I. N.
22	L	22 5.20	1.930	14 6 53.13	125.97	16 55 16.9	527.1	64.66	14 56.6	54 44.8	I. N.
23	U	10 28.71	1.989	14 32 25.76	129.49	-18 35 6.2	-469.5	65.56	14 59.9	54 56.9	I. N.S.
23	L	22 52.93	2.048	14 58 41.24	133.09	20 2 30.6	403.1	66.48	15 3.5	55 10.0	I. N.S.
24	U	11 17.86	2.106	15 25 39.42	136.58	21 15 45.1	327.9	67.37	15 7.3	55 24.1	I. N.S.
24	L	23 43.46	2.160	15 53 18.00	139.79	22 13 7.9	244.5	68.18	15 11.3	55 38.9	II. N.S.
25	U	12 9.66	2.205	16 21 32.58	142.55	-22 53 5.0	-153.8	68.87	15 15.5	55 54.2	II. N.S.
26	L	0 36.35	2.241	16 50 16.68	144.69	23 14 16.9	- 57.3	69.41	15 19.8	56 9.8	II. N.S.
26	U	13 3.40	2.265	17 19 22.17	146.10	23 15 44.0	+ 43.3	69.77	15 24.1	56 25.6	II. N.S.
27	L	1 30.65	2.275	17 48 39.80	146.71	22 56 51.1	145.7	69.95	15 28.4	56 41.4	II. N.S.
27	U	13 57.94	2.272	18 18 0.12	146.55	-22 17 30.3	+247.5	69.94	15 32.7	56 57.1	II. N.S.
28	L	2 25.13	2.258	18 47 14.22	145.70	21 18 2.2	346.5	69.76	15 36.9	57 12.6	II. N.
28	U	14 52.09	2.234	19 16 14.62	144.29	19 59 14.5	440.6	69.44	15 41.1	57 27.9	II. N.
29	L	3 18.73	2.205	19 44 55.75	142.52	18 22 17.5	527.9	69.02	15 45.1	57 42.9	II. N.
29	U	15 45.00	2.173	20 13 14.36	140.58	-16 28 41.9	+606.8	68.56	15 49.1	57 57.5	II. N.
30	L	4 10.88	2.141	20 41 9.49	138.64	14 20 12.3	676.6	68.10	15 53.0	58 11.7	II. N.
30	U	16 36.38	2.112	21 8 42.47	136.91	11 53 44.2	736.4	67.68	15 56.7	58 25.4	II. N.
31	L	5 1.58	2.088	21 35 56.54	135.51	9 26 19.7	785.8	67.34	16 0.3	58 38.6	II. N.
31	U	17 26.54	2.073	22 2 56.57	134.58	- 6 45 7.5	+824.3	67.11	16 3.7	58 51.1	II. N.
June 1	L	5 51.37	2.067	22 29 48.66	134.21	3 57 20.2	851.7	67.02	16 6.9	59 2.9	II. N.
1	U	18 16.18	2.071	22 56 39.85	134.44	- 1 5 14.7	867.3	67.08	16 9.9	59 13.7	II. N.
2	L	6 41.11	2.085	23 23 37.68	135.31	+ 1 48 46.9	870.8	67.30	16 12.5	59 23.3	II. N.
2	U	19 6.27	2.110	23 50 49.90	136.84	+ 4 42 16.0	+861.8	67.68	16 14.7	59 31.5	II. N.
3	L	7 31.80	2.146	0 18 24.12	138.97	7 32 37.3	839.5	68.20	16 16.5	59 38.0	II. N.
3	U	19 57.81	2.190	0 46 27.25	141.64	10 17 7.7	803.2	68.86	16 17.8	59 42.6	II. N.
4	L	8 24.40	2.242	1 15 5.09	144.73	12 52 58.1	752.7	69.61	16 18.5	59 45.1	II. N.
4	U	20 51.63	2.297	1 44 21.72	148.07	+15 17 14.7	+687.6	70.40	16 18.4	59 45.0	II. N.
5	L	9 19.53	2.353	2 14 18.78	151.43	17 27 4.1	608.3	71.20	16 17.7	59 42.3	II. N.
5	U	21 48.08	2.405	2 44 54.99	154.54	19 19 39.6	515.5	71.93	16 16.2	59 36.8	II. N.
6	L	10 17.21	2.447	3 16 5.55	157.11	20 52 30.8	411.1	72.52	16 13.9	59 28.4	II. N.
6	U	22 46.77	2.476	3 47 42.15	158.54	+22 3 32.3	+297.8	72.91	16 10.8	59 17.1	II. N.
7	L	11 16.57	2.487	4 19 33.29	159.49	22 51 15.2	178.7	73.06	16 7.0	59 3.0	II. N.
7	U	23 46.38	2.478	4 51 25.20	158.94	23 14 53.8	+ 57.8	72.93	16 2.5	58 46.5	II. N.
8	L	12 15.96	2.448	5 23 3.10	157.16	23 14 29.3	- 61.1	72.50	15 57.4	58 27.8	II. N.
9	U	0 45.07	2.400	5 54 12.82	154.28	+22 50 49.9	-174.2	71.80	15 51.8	58 7.3	II. N.

May 23, U Defective Illumination of S. 0°.72.
 May 24, U Defective Illumination of N. 0°.07.
 May 25, U Defective Illumination of N. 0°.82.

May 26, U Defective Illumination of N. 0°.44.
 May 27, U Defective Illumination of S. 0°.10.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- d. Pass- ing Mer- idian.	Geocen- tric Semi-di- ameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
		h m	m	h m s	s	" ' "	"	s	" "	" "	
une 9	U	0 45.07	2.400	5 54 12.82	154.28	+22 50 49.9	-174.2	71.80	15 51.8	58 7.3	
9	L	13 13.51	2.337	6 24 42.09	150.48	22 5 23.0	278.6	70.89	15 45.8	57 45.4	
10	U	1 41.12	2.263	6 54 21.59	146.03	21 0 6.8	372.2	69.82	15 39.6	57 22.7	I. N.
10	L	14 7.80	2.184	7 23 5.44	141.24	19 37 18.4	453.8	68.65	15 33.3	56 59.6	
11	U	2 33.52	2.103	7 50 51.08	136.37	+17 59 24.0	-523.2	67.45	15 27.1	56 36.6	I. N.
11	L	14 58.28	2.024	8 17 39.02	131.66	16 8 48.6	580.7	66.26	15 21.0	56 14.2	
12	U	3 22.13	1.951	8 43 32.17	127.27	14 7 51.1	627.1	65.13	15 15.1	55 52.8	I. N.
12	L	15 45.15	1.886	9 8 35.25	123.33	11 58 39.0	663.3	64.12	15 9.7	55 32.9	
13	U	4 7.43	1.830	9 32 54.29	119.94	+ 9 43 7.4	-690.4	63.24	15 4.8	55 14.7	I. N.
13	L	16 29.10	1.783	9 56 36.16	117.14	7 22 59.3	709.6	62.50	15 0.4	54 58.5	
14	U	4 50.27	1.747	10 19 48.17	114.96	4 59 45.7	721.6	61.92	14 56.6	54 44.6	I. N.
14	L	17 11.07	1.721	10 42 37.85	113.43	2 34 47.8	727.1	61.50	14 53.5	54 33.2	
15	U	5 31.63	1.706	11 5 12.85	112.52	+ 0 9 19.5	-726.7	61.25	14 51.0	54 24.3	I. N.
15	L	17 52.07	1.702	11 27 40.78	112.24	- 2 15 30.7	720.7	61.18	14 49.3	54 18.1	
16	U	6 12.51	1.708	11 50 9.14	112.58	4 38 37.3	709.4	61.28	14 48.4	54 14.7	I. N.
16	L	18 33.09	1.723	12 12 45.28	113.53	6 58 55.4	692.6	61.54	14 48.2	54 14.0	
17	U	6 53.91	1.749	12 35 36.38	115.08	- 9 15 18.1	-670.1	61.95	14 48.8	54 16.0	I. N.
17	L	19 15.10	1.784	12 58 49.27	117.17	11 26 35.2	641.6	62.51	14 50.1	54 20.7	
18	U	7 36.75	1.827	13 22 30.36	119.76	13 31 31.0	606.5	63.20	14 52.0	54 27.9	I. N.
18	L	19 58.97	1.878	13 46 45.47	122.82	15 28 43.0	564.2	63.99	14 54.6	54 37.4	
19	U	8 21.84	1.935	14 11 39.58	126.25	-17 16 41.6	-514.2	64.87	14 57.8	54 49.1	I. N.
19	L	20 45.42	1.996	14 37 16.49	129.93	18 53 50.1	455.7	65.81	15 1.6	55 2.9	
20	U	9 9.75	2.059	15 3 38.54	133.74	20 18 25.4	388.6	66.78	15 5.8	55 18.4	I. N.
20	L	21 34.83	2.122	15 30 46.15	137.51	21 28 41.6	312.6	67.72	15 10.4	55 35.2	
21	U	10 0.65	2.180	15 58 37.63	141.02	-22 22 53.5	-228.0	68.58	15 15.3	55 53.2	I. N.
21	L	22 27.13	2.231	16 27 8.91	144.10	22 59 21.7	135.5	69.32	15 20.4	56 12.0	
22	U	10 54.16	2.272	16 56 13.55	146.56	23 16 40.1	- 36.6	69.91	15 25.6	56 31.2	I. N.S.
22	L	23 21.61	2.300	17 25 43.17	148.25	23 13 42.1	+ 66.9	70.32	15 30.9	56 50.5	
23	U	11 49.31	2.314	17 55 27.98	149.08	-22 49 46.6	+172.5	70.52	15 36.1	57 9.5	I. N.S.
24	L	0 17.09	2.314	18 25 17.65	149.06	22 4 43.1	277.7	70.51	15 41.1	57 27.9	
24	U	12 44.78	2.300	18 55 2.24	148.26	20 58 53.3	379.8	70.31	15 45.8	57 45.4	II. N.S.
25	L	1 12.25	2.276	19 24 33.14	146.80	19 33 10.8	476.3	69.97	15 50.3	58 1.8	
25	U	13 39.38	2.245	19 53 43.80	144.91	-17 48 57.6	+564.6	69.52	15 54.4	58 16.7	II. N.
26	L	2 6.11	2.209	20 22 30.01	142.77	15 47 58.7	643.5	69.01	15 58.0	58 30.1	
26	U	14 32.40	2.173	20 50 50.13	140.60	13 32 17.7	711.4	68.49	16 1.2	58 41.9	II. N.
27	L	2 58.27	2.140	21 18 44.90	138.58	11 4 10.5	767.7	68.00	16 4.0	58 52.0	
27	U	15 23.77	2.111	21 46 17.19	136.87	- 8 26 0.2	+811.9	67.60	16 6.3	59 0.5	II. N.
28	L	3 48.97	2.090	22 13 31.56	135.61	5 40 14.4	843.6	67.31	16 8.2	59 7.3	
28	U	16 13.97	2.078	22 40 33.88	134.88	- 2 49 21.9	863.0	67.14	16 9.6	59 12.5	II. N.
29	L	4 38.88	2.076	23 7 30.93	134.73	+ 0 4 7.8	869.9	67.12	16 10.6	59 16.1	
29	U	17 3.82	2.084	23 34 30.03	135.22	+ 2 57 45.6	+864.3	67.26	16 11.1	59 18.3	II. N.
30	L	5 28.93	2.102	0 1 38.63	136.32	5 49 1.6	846.3	67.55	16 11.3	59 19.0	
30	U	17 54.31	2.130	0 29 4.01	138.01	8 35 25.7	815.6	67.99	16 11.2	59 18.4	II. N.
uly 1	L	6 20.08	2.167	0 56 52.80	140.21	11 14 26.4	772.3	68.55	16 10.7	59 16.5	
1	U	18 46.33	2.210	1 25 10.54	142.81	+13 43 31.7	+716.4	69.19	16 9.8	59 13.3	II. N.

June 22, U Defective Illumination of S. 0''.00.

June 24, U Defective Illumination of S. 0''.01.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- d. Pass- ing Mer- idian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	" ' "	"	s	" "	" "	
July 1	U	18 46.33	2.210	1 25 10.54	142.81	+13 43 31.7	+716.4	69.19	16 9.8	59 13.3	II. N.
2	L	7 13.13	2.257	1 54 1.24	145.67	16 0 10.3	647.9	69.89	16 8.5	59 8.7	
2	U	19 40.51	2.306	2 23 26.72	148.57	18 1 54.5	567.5	70.59	16 6.9	59 2.7	II. N.
3	L	8 8.45	2.351	2 53 26.20	151.29	19 46 24.5	475.3	71.23	16 4.9	58 55.3	
3	U	20 36.90	2.389	3 23 55.99	153.58	+21 11 34.8	+374.5	71.76	16 2.5	58 46.4	II. N.
4	L	9 5.74	2.415	3 54 49.25	155.17	22 15 41.7	265.6	72.11	15 59.6	58 36.1	
4	U	21 34.81	2.427	4 25 56.40	155.86	22 57 30.5	152.0	72.24	15 56.4	58 24.3	II. N.
5	L	10 3.91	2.421	4 57 5.79	155.53	23 16 22.0	+ 36.6	72.13	15 52.8	58 11.1	
5	U	22 32.84	2.398	5 28 4.69	154.12	+23 12 15.8	- 77.1	71.77	15 48.9	57 56.5	II. N.
6	L	11 1.39	2.358	5 58 40.61	151.72	22 45 50.9	186.0	71.17	15 44.6	57 40.7	
6	U	23 29.38	2.304	6 28 42.43	148.47	21 58 21.9	287.3	70.36	15 40.0	57 23.8	
7	L	11 56.65	2.240	6 58 1.32	144.60	20 51 31.7	379.2	69.39	15 35.1	57 6.1	
8	U	0 23.10	2.169	7 26 31.26	140.35	+19 27 23.7	-460.2	68.33	15 30.2	56 47.9	
8	L	12 48.69	2.096	7 54 9.13	135.96	17 48 13.1	529.6	67.23	15 25.1	56 29.4	
9	U	1 13.41	2.024	8 20 54.57	131.64	15 56 18.0	587.6	66.13	15 20.1	56 10.8	I. N.
9	L	13 37.29	1.987	8 46 49.44	127.57	13 53 53.9	634.6	65.07	15 15.1	55 52.7	
10	U	2 0.39	1.896	9 11 57.49	123.86	+11 43 9.0	-671.2	64.11	15 10.3	55 35.2	I. N.
10	L	14 22.79	1.841	9 36 23.73	120.60	9 26 2.3	698.4	63.26	15 5.8	55 18.7	
11	U	2 44.60	1.796	10 0 14.11	117.89	7 4 21.6	717.1	62.56	15 1.7	55 3.5	I. N.
11	L	15 5.92	1.760	10 23 35.18	115.72	4 39 44.5	727.9	62.00	14 58.0	54 49.9	
12	U	3 26.87	1.734	10 46 33.81	114.15	+ 2 13 38.3	-731.9	61.59	14 54.8	54 38.1	I. N.
12	L	15 47.56	1.717	11 9 17.09	113.17	- 0 12 37.1	729.6	61.35	14 52.2	54 28.4	
13	U	4 8.12	1.710	11 31 52.16	112.77	2 37 48.6	721.3	61.26	14 50.1	54 20.9	I. N.
13	L	16 28.66	1.714	11 54 26.08	112.97	5 0 47.3	707.5	61.34	14 48.7	54 15.9	
14	U	4 49.29	1.727	12 17 5.93	113.76	- 7 20 26.5	-688.1	61.58	14 48.1	54 13.5	I. N.
14	L	17 10.14	1.749	12 39 58.57	115.11	9 35 39.8	663.1	61.97	14 48.1	54 13.7	
15	U	5 31.32	1.781	13 3 10.69	117.00	11 45 18.8	632.3	62.50	14 48.9	54 16.6	I. N.
15	L	17 52.92	1.821	13 26 48.63	119.40	13 48 12.2	595.5	63.16	14 50.5	54 22.3	
16	U	6 15.04	1.868	13 50 58.22	122.27	-15 43 2.5	-551.8	63.93	14 52.8	54 30.7	I. N.
16	L	18 37.78	1.923	14 15 44.59	125.53	17 28 27.0	501.0	64.79	14 55.8	54 41.8	
17	U	7 1.20	1.982	14 41 11.94	129.08	19 2 56.5	442.5	65.72	14 59.5	54 55.4	I. N.
17	L	19 25.35	2.044	15 7 23.16	132.81	20 24 55.3	375.9	66.67	15 3.9	55 11.4	
18	U	7 50.25	2.106	15 34 19.51	136.58	-21 32 44.1	-300.9	67.61	15 8.8	55 29.6	I. N.
18	L	20 15.89	2.166	16 2 0.31	140.19	22 24 42.0	217.4	68.50	15 14.3	55 49.7	
19	U	8 42.22	2.221	16 30 22.69	143.47	22 59 11.8	126.2	69.29	15 20.2	56 11.4	I. N.
19	L	21 9.16	2.267	16 59 21.55	146.24	23 14 44.7	- 28.2	69.95	15 26.4	56 34.3	
20	U	9 36.58	2.302	17 28 49.71	148.34	-23 10 8.6	+ 75.0	70.44	15 32.9	56 57.9	I. N.S.
20	L	22 4.35	2.324	17 58 38.45	149.65	22 44 33.0	181.3	70.73	15 39.4	57 21.9	
21	U	10 32.29	2.332	18 28 38.06	150.16	21 57 35.4	288.2	70.83	15 45.9	57 45.5	I. N.S.
21	L	23 0.26	2.327	18 58 38.96	149.88	20 49 25.8	392.8	70.74	15 52.1	58 8.4	
22	U	11 28.10	2.311	19 28 32.38	148.92	-19 20 47.0	+492.5	70.49	15 58.0	58 30.1	I. N.S.
22	L	23 55.70	2.287	19 58 11.15	147.47	17 32 54.6	584.7	70.12	16 3.4	58 50.0	
23	U	12 22.97	2.258	20 27 30.30	145.70	15 27 32.4	667.1	69.68	16 8.3	59 7.7	II. N.
24	L	0 49 88	2.226	20 56 27.26	143.80	13 6 48.6	738.0	69.22	16 12.4	59 22.8	
24	U	13 16.41	2.196	21 25 1.71	141.97	-10 33 10.0	+796.1	68.77	16 15.7	59 35.1	II. N.

July 20, U Defective Illumination of S. 0°.12.
 July 21, U Defective Illumination of N. 0°.02.

July 22, U Defective Illumination of S. 0°.00.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- Pass- ing Meridian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	" ' "	"	s	" "	" "	
July 24	U	13 16.41	2.196	21 25 1.71	141.97	-10 33 10.0	+796.1	68.77	16 15.7	59 35.1	II. N.
25	L	1 42.60	2.169	21 53 15.54	140.39	7 49 16.7	840.4	68.39	16 18.2	59 44.3	
25	U	14 8.50	2.149	22 21 12.35	139.16	4 57 55.8	870.6	68.11	16 19.9	59 50.4	II. N.
26	L	2 34.21	2.136	22 48 57.11	138.38	- 2 1 59.0	886.4	67.94	16 20.7	59 53.5	
26	U	14 59.81	2.132	23 16 35.69	138.14	+ 0 55 41.2	+887.9	67.91	16 20.8	59 53.7	II. N.
27	L	3 25.41	2.137	23 44 14.51	138.42	3 52 14.6	875.2	68.01	16 20.1	59 51.1	
27	U	15 51.13	2.151	0 12 0.09	139.26	6 44 54.3	849.0	68.24	16 18.7	59 46.0	II. N.
28	L	4 17.06	2.173	0 39 58.61	140.58	9 30 57.9	809.4	68.60	16 16.7	59 38.7	
28	U	16 43.30	2.202	1 8 15.58	142.32	+12 7 48.2	+756.9	69.06	16 14.2	59 29.6	II. N.
29	L	5 9.92	2.235	1 36 55.33	144.35	14 32 54.5	692.2	69.58	16 11.3	59 18.8	
29	U	17 36.96	2.272	2 6 0.58	146.54	16 43 55.1	616.0	70.13	16 8.0	59 6.8	II. N.
30	L	6 4.44	2.307	2 35 32.06	148.69	18 38 38.6	529.4	70.66	16 4.5	58 53.8	
30	U	18 32.33	2.339	3 5 28.14	150.59	+20 15 8.3	+434.0	71.12	16 0.7	58 40.1	II. N.
31	L	7 0.55	2.364	3 35 44.68	152.07	21 31 46.0	331.3	71.47	15 56.8	58 25.7	
31	U	19 29.01	2.377	4 6 15.15	152.89	22 27 17.4	223.4	71.65	15 52.8	58 10.8	II. N.
Aug. 1	L	7 57.56	2.378	4 36 50.94	152.93	23 0 55.8	112.8	71.63	15 48.6	57 55.7	
1	U	20 26.03	2.364	5 7 22.10	152.11	+23 12 25.5	+ 2.3	71.40	15 44.4	57 40.2	II. N.
2	L	8 54.25	2.337	5 37 38.23	150.43	23 2 3.0	-105.5	70.95	15 40.1	57 24.6	
2	U	21 22.06	2.296	6 7 29.36	147.97	22 30 36.3	208.1	70.31	15 35.9	57 8.9	II. N.
3	L	9 49.30	2.244	6 36 46.88	144.86	21 39 19.7	303.4	69.51	15 31.6	56 53.2	
3	U	22 15.88	2.185	7 5 24.14	141.30	+20 29 50.5	-389.9	68.59	15 27.3	56 37.5	II. S.
4	L	10 41.71	2.121	7 33 16.77	137.46	19 4 0.8	466.6	67.59	15 23.1	56 21.8	
4	U	23 6.77	2.056	8 0 22.74	133.55	17 23 52.2	533.0	66.57	15 18.8	56 6.2	
5	L	11 31.06	1.992	8 26 42.14	129.71	15 31 29.7	589.0	65.57	15 14.7	55 51.0	
5	U	23 54.60	1.932	8 52 16.90	126.12	+13 28 57.1	-634.8	64.61	15 10.6	55 36.1	
6	L	12 17.46	1.878	9 17 10.41	122.86	11 18 14.1	670.8	63.74	15 6.7	55 21.7	
7	U	0 39.71	1.831	9 41 27.14	120.01	9 1 13.9	697.7	62.98	15 2.9	55 8.0	
7	L	13 1.43	1.791	10 5 12.36	117.61	6 39 41.9	716.2	62.34	14 59.4	54 55.2	
8	U	1 22.72	1.759	10 28 31.81	115.72	+ 4 15 15.5	-726.8	61.84	14 56.3	54 43.5	I. N.
8	L	13 43.69	1.736	10 51 31.60	114.34	+ 1 49 25.3	730.3	61.48	14 53.4	54 33.0	
9	U	2 4.44	1.722	11 14 17.97	113.48	- 0 36 25.5	727.1	61.27	14 50.9	54 24.0	I. N.
9	L	14 25.07	1.717	11 36 57.27	113.15	3 0 59.0	717.5	61.21	14 49.0	54 16.7	
10	U	2 45.68	1.720	11 59 35.80	113.35	- 5 23 1.4	-701.9	61.29	14 47.5	54 11.2	I. N.
10	L	15 6.38	1.732	12 22 19.81	114.07	7 41 21.9	680.5	61.52	14 46.5	54 7.7	
11	U	3 27.28	1.752	12 45 15.43	115.29	9 54 51.2	653.3	61.89	14 46.2	54 6.5	I. N.
11	L	15 48.47	1.781	13 8 28.57	116.99	12 2 19.2	620.3	62.39	14 46.5	54 7.6	
12	U	4 10.05	1.816	13 32 4.84	119.15	-14 2 35.1	-681.3	63.01	14 47.5	54 11.2	I. N.
12	L	16 32.09	1.859	13 56 9.40	121.69	15 54 24.9	535.9	63.72	14 49.2	54 17.4	
13	U	4 54.68	1.907	14 20 46.84	124.60	17 36 30.6	483.9	64.52	14 51.6	54 26.3	I. N.
13	L	17 17.88	1.960	14 46 0.86	127.78	19 7 31.0	424.9	65.38	14 54.7	54 37.9	
14	U	5 41.73	2.016	15 11 54.20	131.13	-20 26 0.5	-358.7	66.27	14 58.6	54 52.1	I. N.
14	L	18 6.26	2.072	15 38 28.19	134.53	21 30 30.9	285.1	67.14	15 3.2	55 9.0	
15	U	6 31.46	2.127	16 5 42.66	137.85	22 19 33.5	204.1	67.98	15 8.5	55 28.4	I. N.
15	L	18 57.30	2.179	16 33 35.66	140.93	22 51 41.9	116.1	68.75	15 14.4	55 50.2	
16	U	7 23.72	2.224	17 2 3.49	143.64	-23 5 36.4	- 21.9	69.40	15 20.9	56 14.0	I. N.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Aug. 16	U	7 23.72	2.224	17 2 3.49	143.64	-23 5 36.4	-21.9	69.40	15 20.9	56 14.0	I. N.
16	L	19 50.63	2.260	17 31 0.74	145.82	23 0 8.9	+77.3	69.92	15 27.9	56 39.5	
17	U	8 17.92	2.286	18 0 20.67	147.40	22 34 28.1	179.9	70.28	15 35.2	57 6.4	I. N.S.
17	L	20 45.46	2.302	18 29 55.73	148.33	21 48 4.7	284.0	70.48	15 42.8	57 34.2	
18	U	9 13.12	2.307	18 59 38.15	148.63	-20 40 55.3	+387.2	70.52	15 50.4	58 2.3	I. S.
18	L	21 40.78	2.302	19 29 20.70	148.37	19 13 25.9	486.9	70.43	15 58.0	58 30.0	
19	U	10 8.34	2.290	19 58 57.24	147.66	17 26 31.6	580.8	70.22	16 5.3	58 56.7	I. S.
19	L	22 35.73	2.274	20 28 23.33	146.65	15 21 37.6	666.5	69.95	16 12.1	59 21.7	
20	U	11 2.90	2.255	20 57 36.34	145.51	-13 0 36.4	+741.7	69.64	16 18.2	59 44.3	I. N.S.
20	L	23 29.84	2.236	21 26 35.61	144.39	10 25 44.4	804.6	69.35	16 23.6	60 4.0	
21	U	11 56.58	2.220	21 55 22.38	143.44	7 39 39.0	853.8	69.11	16 28.0	60 20.1	I. II. N.
22	L	0 23.15	2.209	22 23 59.44	142.79	4 45 13.2	887.9	68.94	16 31.3	60 32.1	
22	U	12 49.63	2.205	22 52 30.78	142.50	-1 45 32.2	+906.3	68.88	16 33.4	60 39.9	II. N.
23	L	1 16.10	2.207	23 21 1.27	142.65	+1 16 12.1	908.4	68.93	16 34.3	60 43.4	
23	U	13 42.63	2.217	23 49 36.15	143.23	4 16 44.1	894.2	69.10	16 34.1	60 42.4	II. N.
24	L	2 9.33	2.234	0 18 20.65	144.24	7 12 49.8	864.0	69.38	16 32.7	60 37.2	
24	U	14 36.27	2.257	0 47 19.52	145.62	+10 1 20.2	+818.5	69.75	16 30.2	60 28.2	II. N.
25	L	3 3.50	2.284	1 16 36.56	147.25	12 39 15.2	758.4	70.18	16 26.8	60 15.8	
25	U	15 31.08	2.313	1 46 14.15	149.03	15 3 47.4	684.9	70.64	16 22.6	60 0.4	II. N.
26	L	3 59.02	2.342	2 16 12.89	150.75	17 12 25.2	599.6	71.09	16 17.8	59 42.7	
26	U	16 27.27	2.367	2 46 31.24	152.25	+19 2 57.8	+504.4	71.49	16 12.5	59 23.2	II. N.
27	L	4 55.79	2.385	3 17 5.38	153.36	20 33 38.4	401.3	71.78	16 6.9	59 2.5	
27	U	17 24.48	2.394	3 47 49.36	153.87	21 43 7.6	292.9	71.91	16 1.0	58 41.0	II. N.
28	L	5 53.19	2.390	4 18 35.34	153.67	22 30 37.1	181.8	71.86	15 55.0	58 19.2	
28	U	18 21.79	2.374	4 49 14.28	152.69	+22 55 50.0	+70.6	71.62	15 49.1	57 57.5	II. N.
29	L	6 50.12	2.345	5 19 36.71	150.92	22 59 1.1	-38.1	71.18	15 43.3	57 36.2	
29	U	19 18.02	2.303	5 49 33.57	148.44	22 40 55.0	142.0	70.55	15 37.7	57 15.4	II. N.
30	L	7 45.36	2.252	6 18 56.99	145.37	22 2 40.8	239.2	69.76	15 32.2	56 55.5	
30	U	20 12.05	2.194	6 47 40.86	141.88	+21 5 47.8	-328.3	68.85	15 27.0	56 36.4	II. S.
31	L	8 38.01	2.132	7 15 41.12	138.14	19 51 59.3	408.3	67.87	15 22.1	56 18.3	
31	U	21 3.21	2.069	7 42 55.80	134.31	18 23 6.7	478.8	66.86	15 17.5	56 1.3	II. S.
Sept. 1	L	9 27.66	2.006	8 9 24.94	130.56	16 41 5.5	539.7	65.85	15 13.1	55 45.2	
1	U	21 51.38	1.947	8 35 10.22	127.02	+14 47 50.9	-591.2	64.89	15 9.0	55 30.2	II. S.
2	L	10 14.42	1.893	9 0 14.68	123.77	12 45 15.2	633.3	64.00	15 5.2	55 16.2	
2	U	22 36.85	1.846	9 24 42.42	120.91	10 35 6.2	666.7	63.21	15 1.7	55 3.3	II. S.
3	L	10 58.75	1.805	9 48 38.26	118.47	8 19 6.3	691.8	62.52	14 58.4	54 51.3	
3	U	23 20.21	1.772	10 12 7.48	116.48	+5 58 52.4	-709.2	61.96	14 55.4	54 40.4	
4	L	11 41.31	1.747	10 35 15.66	114.97	3 35 56.2	719.0	61.53	14 52.7	54 30.6	
5	U	0 2.17	1.730	10 58 8.55	113.93	+1 11 44.2	721.8	61.25	14 50.4	54 22.0	
5	L	12 22.86	1.721	11 20 51.93	113.38	-1 12 21.0	717.9	61.10	14 48.4	54 14.5	
6	U	0 43.49	1.719	11 43 31.56	113.30	-3 35 0.7	-707.6	61.09	14 46.7	54 8.3	
6	L	13 4.16	1.726	12 6 13.06	113.69	5 54 58.5	691.0	61.21	14 45.4	54 3.6	
7	U	1 24.94	1.740	12 29 1.90	114.53	8 10 59.7	668.2	61.47	14 44.5	54 0.4	I. N.
7	L	13 45.94	1.761	12 52 3.38	115.79	10 21 50.8	639.3	61.85	14 44.1	53 58.8	
8	U	2 7.23	1.788	13 15 22.40	117.45	-12 26 18.2	-604.3	62.33	14 44.1	53 59.0	I. N.

Aug. 20, U Defective Illumination of N. 0'.06.

Aug. 21, U Defective Illumination of II. 0'.02.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi-d. Pass- ing Me- ridian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	° ' "	' "	' "	
Sept. 8	U	2 7.23	1.788	13 15 22.40	117.45	-12 26 18.2	-604.2	62.33	14 44.1	53 59.0	I. N.
8	L	14 28.88	1.822	13 39 3.58	119.47	14 23 7.8	563.0	62.91	14 44.7	54 1.1	
9	U	2 50.97	1.861	14 3 10.95	121.81	16 11 4.8	515.5	63.58	14 45.9	54 5.4	I. N.
9	L	15 13.56	1.904	14 27 47.92	124.39	17 48 53.0	461.5	64.30	14 47.6	54 11.8	
10	U	3 36.68	1.950	14 52 57.10	127.16	-19 15 14.4	-401.1	65.07	14 50.0	54 20.5	I. N.
10	L	16 0.36	1.997	15 18 40.10	130.01	20 28 51.7	334.2	65.85	14 53.1	54 31.7	
11	U	4 24.61	2.044	15 44 57.42	132.86	21 28 27.4	260.8	66.62	14 56.8	54 45.4	I. N.
11	L	16 49.42	2.090	16 11 48.28	135.59	22 12 46.0	181.4	67.34	15 1.2	55 1.5	
12	U	5 14.75	2.131	16 39 10.58	138.09	-22 40 37.2	- 96.3	67.99	15 6.3	55 20.2	I. N.
12	L	17 40.55	2.187	17 7 1.02	140.26	22 50 57.4	- 6.3	68.55	15 12.0	55 41.3	
13	U	6 6.74	2.197	17 35 15.16	142.03	22 42 53.8	+ 87.4	68.99	15 18.4	56 4.8	I. N.S.
13	L	18 33.24	2.219	18 3 47.81	143.34	22 15 47.7	183.8	69.31	15 25.4	56 30.3	
14	U	6 59.95	2.233	18 32 33.41	144.19	-21 29 16.4	+281.3	69.51	15 32.8	56 57.7	I. S.
14	L	19 26.79	2.240	19 1 26.49	144.60	20 23 16.9	378.2	69.59	15 40.7	57 26.5	
15	U	7 53.68	2.240	19 30 22.23	144.64	18 58 7.6	472.7	69.57	15 48.8	57 56.3	I. S.
15	L	20 20.54	2.236	19 59 16.72	144.41	17 14 29.4	562.7	69.48	15 57.1	58 26.6	
16	U	8 47.34	2.230	20 28 7.44	144.02	-15 13 26.4	+446.5	69.35	16 5.2	58 56.6	I. S.
16	L	21 14.06	2.223	20 56 53.31	143.62	12 56 26.1	722.0	69.22	16 13.1	59 25.6	
17	U	9 40.71	2.218	21 25 34.85	143.33	10 25 19.0	787.3	69.12	16 20.6	59 52.9	I. S.
17	L	22 7.32	2.217	21 54 13.94	143.24	7 42 18.2	840.6	69.07	16 27.4	60 17.7	
18	U	10 33.94	2.221	22 22 53.75	143.46	- 4 49 57.7	+890.3	69.10	16 33.2	60 39.1	I. S.
18	L	23 0.64	2.230	22 51 38.39	144.05	- 1 51 10.5	904.9	69.22	16 37.9	60 56.5	
19	U	11 27.49	2.247	23 20 32.55	145.06	+ 1 10 53.2	913.0	69.46	16 41.4	61 9.2	I. N.S.
19	L	23 54.59	2.271	23 49 41.21	146.46	4 12 51.0	903.7	69.81	16 43.5	61 16.9	
20	U	12 22.01	2.300	0 19 8.99	148.22	+ 7 11 11.3	+876.7	70.25	16 44.1	61 19.3	II. N.
21	L	0 49.81	2.334	0 48 59.76	150.37	10 2 20.5	831.9	70.76	16 43.3	61 16.3	
21	U	13 18.03	2.370	1 19 16.04	152.46	12 42 48.4	770.0	71.31	16 41.1	61 8.2	II. N.
22	L	1 46.69	2.406	1 49 58.50	154.61	15 9 16.8	692.2	71.86	16 37.6	60 55.3	
22	U	14 15.76	2.438	2 21 5.52	156.51	+17 18 46.3	+900.5	72.35	16 32.9	60 38.1	II. N.
23	L	2 45.16	2.461	2 52 32.85	157.95	19 8 43.8	497.4	72.72	16 27.2	60 17.4	
23	U	15 14.79	2.474	3 24 13.67	158.72	20 37 10.6	386.0	72.94	16 20.8	59 53.8	II. N.
24	L	3 44.49	2.474	3 55 58.90	158.67	21 42 46.8	269.6	72.96	16 13.8	59 28.2	
24	U	16 14.09	2.457	4 27 37.94	157.08	+22 24 54.4	+151.8	72.75	16 6.5	59 1.2	II. N.
25	L	4 43.39	2.425	4 58 59.54	155.76	22 43 36.7	+ 35.9	72.31	15 59.0	58 33.6	
25	U	17 12.23	2.379	5 29 52.95	153.00	22 39 35.1	- 75.1	71.66	15 51.5	58 6.0	II. N.
26	L	5 40.45	2.322	6 0 8.85	149.55	22 14 2.7	178.9	70.82	15 44.1	57 38.9	
26	U	18 7.92	2.256	6 29 40.02	145.59	+21 28 36.3	-273.9	69.84	15 37.0	57 12.8	II. S.
27	L	6 34.58	2.185	6 58 21.74	141.34	20 25 8.6	359.0	68.77	15 30.2	56 47.9	
27	U	19 0.37	2.113	7 26 11.83	137.02	19 5 40.5	433.9	67.65	15 23.8	56 24.6	II. S.
28	L	7 25.31	2.043	7 53 10.45	132.78	17 32 14.2	498.8	66.54	15 17.9	56 2.9	
28	U	19 49.42	1.977	8 19 19.63	128.79	+15 46 49.6	-553.8	65.47	15 12.5	55 43.0	II. S.
29	L	8 12.77	1.916	8 44 42.96	125.16	13 51 20.8	599.5	64.48	15 7.5	55 24.9	
29	U	20 35.44	1.863	9 9 25.12	121.94	11 47 35.6	636.6	63.59	15 3.1	55 8.6	II. S.
30	L	8 57.52	1.817	9 33 31.52	119.20	9 37 13.8	665.7	62.81	14 59.2	54 54.2	
30	U	21 19.10	1.780	9 57 7.99	116.96	+ 7 21 49.2	-687.2	62.17	14 55.7	54 41.4	II. S.

Sept. 13, U Defective Illumination of S. 0''.82.

Sept. 19, U Defective Illumination of S. 0' 48".

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Meri- dian.	Geocen- tric Semid- iameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	" "	" "	s	" "	" "	
Sept. 30	U	21 19.10	1.780	9 57 7.99	116.96	+ 7 21 49.2	-687.2	62.17	14 55.7	54 41.4	II. S.
Oct. 1	L	9 40.28	1.751	10 20 20.61	115.23	5 2 49.3	701.6	61.66	14 57.2	54 30.4	
1	U	22 1.17	1.731	10 43 15.52	114.01	2 41 37.1	709.3	61.29	14 50.1	54 21.0	II. S.
2	L	10 21.86	1.719	11 5 58.78	113.29	+ 0 19 31.6	710.4	61.06	14 48.0	54 13.1	
2	U	22 42.46	1.715	11 28 36.37	113.06	- 2 2 9.7	-705.4	60.97	14 46.2	54 6.7	II. S.
3	L	11 3.06	1.719	11 51 14.02	113.30	4 22 11.7	694.0	61.02	14 44.9	54 1.7	
3	U	23 23.75	1.730	12 13 57.24	113.97	6 39 19.3	676.2	61.20	14 43.9	53 58.1	
4	L	11 44.62	1.749	12 36 51.21	115.08	8 52 17.2	652.3	61.50	14 43.3	53 55.8	
5	U	0 5.75	1.774	13 0 0.75	116.57	-10 59 49.7	-622.1	61.91	14 43.0	53 55.0	
5	L	12 27.21	1.804	13 23 30.19	118.39	13 0 40.0	585.3	62.42	14 43.2	53 55.6	
6	U	0 49.06	1.839	13 47 23.28	120.50	14 53 29.8	542.0	63.00	14 43.7	53 57.6	I. N.
6	L	13 11.36	1.878	14 11 43.09	122.83	16 37 0.7	492.1	63.65	14 44.7	54 1.2	
7	U	1 34.14	1.919	14 36 31.80	125.31	-18 9 54.0	-435.7	64.34	14 46.1	54 6.4	I. N.
7	L	13 57.42	1.961	15 1 50.67	127.84	19 30 51.6	372.8	65.04	14 48.0	54 13.2	
8	U	2 21.20	2.003	15 27 39.83	130.34	20 38 37.9	303.9	65.73	14 50.4	54 21.9	I. N.
8	L	14 45.47	2.042	15 53 58.28	132.71	21 32 1.2	229.1	66.37	14 53.2	54 32.4	
9	U	3 10.19	2.077	16 20 43.81	134.84	-22 9 56.2	-149.2	66.96	14 56.6	54 44.9	I. N.
9	L	15 35.31	2.108	16 47 53.17	136.66	22 31 25.6	- 65.0	67.46	15 0.6	54 59.4	
10	U	4 0.75	2.132	17 15 22.23	138.11	22 35 42.8	+ 22.6	67.86	15 5.1	55 16.1	I. N.
10	L	16 26.44	2.149	17 43 6.25	139.15	22 22 14.0	112.5	68.15	15 10.2	55 34.8	
11	U	4 52.30	2.160	18 11 0.31	139.78	-21 50 39.4	+203.4	68.33	15 15.9	55 55.7	I. S.
11	L	17 18.25	2.164	18 38 59.68	140.05	21 0 54.0	294.0	68.41	15 22.1	56 18.5	
12	U	5 44.22	2.163	19 7 0.26	140.00	19 53 9.4	383.0	68.41	15 28.9	56 43.3	I. S.
12	L	18 10.15	2.159	19 34 58.91	139.74	18 27 52.5	469.1	68.35	15 36.1	57 9.7	
13	U	6 36.02	2.153	20 2 53.68	139.38	-16 45 46.4	+551.0	68.25	15 43.7	57 37.4	I. S.
13	L	19 1.82	2.147	20 30 44.09	139.04	14 47 49.7	627.4	68.14	15 51.5	58 6.2	
14	U	7 27.56	2.143	20 58 31.06	138.82	12 35 16.4	696.9	68.07	15 59.5	58 35.5	I. S.
14	L	19 53.28	2.144	21 26 16.83	138.85	10 9 37.1	758.2	68.05	16 7.4	59 4.7	
15	U	8 19.04	2.150	21 54 5.01	139.24	- 7 32 38.9	+809.8	68.11	16 15.2	59 33.1	I. S.
15	L	20 44.92	2.164	22 22 0.18	140.04	4 46 26.4	850.2	68.28	16 22.5	60 0.0	
16	U	9 11.00	2.185	22 50 7.72	141.31	- 1 53 23.6	877.9	68.57	16 29.2	60 24.6	I. S.
16	L	21 37.39	2.214	23 18 33.50	143.07	+ 1 3 47.1	891.3	68.99	16 35.1	60 46.1	
17	U	10 4.18	2.252	23 47 23.52	145.33	+ 4 2 3.9	+888.7	69.53	16 39.9	61 3.8	I. S.
17	L	22 31.46	2.297	0 16 43.30	148.03	6 58 8.2	869.0	70.17	16 43.5	61 16.9	
18	U	10 59.32	2.347	0 46 37.54	151.05	9 48 27.9	831.1	70.89	16 45.6	61 24.9	I. N.S.
18	L	23 27.80	2.400	1 17 9.29	154.25	12 29 23.2	774.9	71.66	16 46.3	61 27.4	
19	U	11 56.92	2.452	1 48 19.34	157.39	+14 57 14.7	+700.6	72.42	16 45.5	61 24.3	II. N.
20	L	0 26.63	2.500	2 20 5.59	160.24	17 8 33.7	609.7	73.11	16 43.2	61 15.7	
20	U	12 56.86	2.537	2 52 22.55	162.47	19 0 14.0	504.7	73.65	16 39.4	61 1.9	II. N.
21	L	1 27.45	2.559	3 25 1.33	163.82	20 29 44.5	388.8	73.99	16 34.3	60 43.4	
21	U	13 58.21	2.564	3 57 49.99	164.08	+21 35 18.6	+266.1	74.08	16 28.2	60 20.9	II. N.
22	L	2 28.90	2.548	4 30 34.51	163.12	22 16 2.1	141.1	73.89	16 21.2	59 55.2	
22	U	14 59.27	2.512	5 3 0.22	160.96	22 31 53.6	+ 18.2	73.41	16 13.6	59 27.1	II. N.
23	L	3 29.10	2.457	5 34 53.15	157.69	22 23 42.1	- 98.7	72.67	16 5.5	58 57.4	
23	U	15 58.19	2.389	6 6 1.52	153.58	+21 52 57.8	-206.9	71.70	15 57.2	58 27.0	II. N.S.

Oct. 18, U Defective Illumination of N. 0°.01.

Oct. 23, U Defective Illumination of N. 0°.24.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Meridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Oct. 23	U	15 58.19	2.389	6 6 1.52	153.58	+21 52 57.8	-206.9	71.70	15 57.2	58 27.0	II. N.S.
24	U	4 26.39	2.311	6 36 16.63	148.87	21 1 40.0	304.1	70.57	15 48.9	57 56.6	
24	L	16 53.62	2.227	7 5 33.12	143.86	19 52 6.4	389.5	69.35	15 40.8	57 28.9	II. S.
25	L	5 19.84	2.143	7 33 49.04	138.81	18 26 40.8	462.8	68.10	15 33.0	56 58.3	
25	U	17 45.07	2.062	8 1 5.30	133.94	+16 47 45.3	-524.6	66.86	15 25.6	56 31.8	II. S.
26	L	6 9.37	1.987	8 27 25.09	129.42	14 57 35.0	575.5	65.68	15 18.8	56 6.2	
26	U	18 32.80	1.920	8 52 53.30	125.36	12 58 13.8	616.5	64.60	15 12.5	55 43.2	II. S.
27	L	6 55.48	1.861	9 17 35.94	121.84	10 51 34.3	648.6	63.65	15 6.9	55 22.4	
27	U	19 17.51	1.812	9 41 39.70	118.88	+ 8 39 17.5	-672.8	62.83	15 1.9	55 4.0	II. S.
28	L	7 39.01	1.773	10 5 11.62	116.53	6 22 55.1	689.7	62.15	14 57.5	54 48.0	
28	U	20 0.10	1.744	10 28 18.82	114.77	4 3 49.8	700.1	61.63	14 53.7	54 34.3	II. S.
29	L	8 20.90	1.724	10 51 8.37	113.59	+ 1 43 18.4	704.1	61.27	14 50.6	54 22.9	
29	U	20 41.52	1.714	11 13 47.13	112.97	- 0 37 26.2	-702.3	61.07	14 48.1	54 13.7	II. S.
30	L	9 2.07	1.713	11 36 21.77	112.90	2 57 14.1	694.8	61.01	14 46.2	54 6.6	
30	U	21 22.65	1.720	11 58 58.61	113.33	5 14 55.8	681.3	61.10	14 44.8	54 1.5	II. S.
31	L	9 43.38	1.735	12 21 43.63	114.25	7 29 21.1	661.9	61.33	14 43.9	53 58.3	
31	U	22 4.33	1.758	12 44 42.34	116.61	- 9 39 17.9	-636.5	61.67	14 43.6	53 56.9	II. S.
Nov. 1	L	10 25.59	1.787	13 7 59.78	117.36	11 43 32.0	604.8	62.12	14 43.6	53 57.0	
1	U	22 47.23	1.822	13 31 40.29	119.44	13 40 46.1	566.4	62.67	14 44.0	53 58.7	
2	L	11 9.32	1.861	13 55 47.52	121.80	15 29 40.5	521.4	63.29	14 44.9	54 1.8	
2	U	23 31.90	1.903	14 20 24.13	124.33	-17 8 53.2	-499.5	63.96	14 46.1	54 6.3	
3	L	11 54.99	1.946	14 45 31.65	126.94	18 37 1.7	410.8	64.65	14 47.7	54 12.0	
4	U	0 18.60	1.989	15 11 10.49	129.53	19 52 44.6	345.3	65.33	14 49.6	54 19.0	
4	L	12 42.71	2.030	15 37 19.60	131.96	20 54 43.7	273.5	66.98	14 51.8	54 27.2	
5	U	1 7.29	2.066	16 3 56.56	134.15	-21 41 47.3	-196.2	66.56	14 54.4	54 36.7	I. N.
5	L	13 32.27	2.096	16 30 57.64	135.97	22 12 52.8	114.1	67.06	14 57.3	54 47.4	
6	U	1 57.57	2.119	16 58 18.00	137.34	22 27 9.9	- 28.3	67.44	15 0.6	54 59.4	I. N.
6	L	14 23.10	2.134	17 25 52.07	138.24	22 24 2.7	+ 59.8	67.70	15 4.2	55 12.7	
7	U	2 48.75	2.141	17 53 33.87	138.65	-22 3 12.3	+148.6	67.84	15 8.2	55 27.3	I. S.
7	L	15 14.44	2.140	18 21 17.64	138.58	21 24 36.5	237.1	67.86	15 12.5	55 43.2	
8	U	3 40.07	2.132	18 48 58.23	138.13	20 28 30.1	323.6	67.78	15 17.3	56 0.7	I. S.
8	L	16 5.59	2.120	19 16 31.63	137.40	19 15 24.2	406.8	67.62	15 22.4	56 19.6	
9	U	4 30.94	2.105	19 43 55.12	136.51	-17 46 4.1	+485.8	67.42	15 27.9	56 39.8	I. S.
9	L	16 56.11	2.090	20 11 7.60	135.59	16 1 27.8	559.4	67.21	15 33.8	57 1.3	
10	U	5 21.10	2.076	20 38 9.54	134.77	14 2 43.9	636.9	67.01	15 40.0	57 24.0	I. S.
10	L	17 45.95	2.067	21 5 3.03	134.19	11 51 11.7	687.3	66.87	15 46.4	57 47.6	
11	U	6 10.72	2.063	21 31 51.55	133.96	- 9 28 18.9	+740.1	66.81	15 53.0	58 11.9	I. S.
11	L	18 35.49	2.066	21 58 39.84	134.16	6 55 43.6	784.3	66.86	15 59.8	58 36.6	
12	U	7 0.35	2.078	22 25 33.71	134.90	4 15 14.7	818.9	67.03	16 6.5	59 1.1	I. S.
12	L	19 25.41	2.100	22 52 39.72	136.20	- 1 28 52.9	842.9	67.34	16 13.0	59 25.1	
13	U	7 50.79	2.132	23 20 4.96	138.11	+ 1 21 6.4	+854.9	67.80	16 19.2	59 47.8	I. S.
13	L	20 16.61	2.173	23 47 56.70	140.62	4 12 13.2	853.8	68.40	16 24.9	60 8.7	
14	U	8 42.99	2.224	0 16 22.01	143.69	7 1 39.5	838.0	69.14	16 29.9	60 27.1	I. S.
14	L	21 10.03	2.283	0 45 27.15	147.34	9 46 21.6	806.2	69.99	16 34.0	60 42.3	
15	U	9 37.81	2.348	1 15 17.04	151.12	+12 23 1.6	+757.5	70.92	16 37.1	60 53.7	I. S.

Oct. 23, U Defective Illumination of N. O' 2A.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Nov. 15	L	22 6.38	2.414	1 45 54.41	155.11	+14 48 12.0	+691.2	71.86	16 39.1	61 0.8	
16	U	10 35.74	2.478	2 17 19.09	158.95	16 58 23.9	607.9	72.76	16 39.7	61 3.1	I. S.
16	L	23 5.83	2.534	2 49 27.21	162.29	18 50 18.1	508.6	73.54	16 39.0	61 0.4	
17	U	11 36.50	2.576	3 22 10.88	164.81	20 20 58.7	396.1	74.13	16 36.9	60 52.7	I. II. N.S.
18	L	0 7.56	2.599	3 55 18.22	166.19	+21 28 7.2	+274.0	74.46	16 33.5	60 40.1	
18	U	12 38.77	2.599	4 28 34.14	166.22	22 10 14.4	146.7	74.48	16 28.8	60 23.0	II. N.S.
19	L	1 9.84	2.575	5 1 41.69	164.80	22 26 48.8	+ 19.3	74.16	16 23.1	60 2.0	
19	U	13 40.49	2.529	5 34 23.95	162.02	22 18 17.8	-103.5	73.52	16 16.4	59 37.7	II. N.S.
20	L	2 10.47	2.464	6 6 25.75	158.10	+21 46 0.8	-217.6	72.62	16 9.1	59 10.9	
20	U	14 39.57	2.385	6 37 35.08	153.34	20 51 59.2	320.5	71.51	16 1.4	58 42.4	II. S.
21	L	3 7.67	2.297	7 7 43.91	148.08	19 38 40.9	410.3	70.26	15 53.4	58 13.0	
21	U	15 34.70	2.207	7 36 48.22	142.64	18 8 47.0	486.5	68.94	15 45.3	57 43.3	II. S.
22	L	4 0.65	2.118	8 4 47.68	137.31	+16 24 59.4	-549.3	67.62	15 37.3	57 14.1	
22	U	16 25.56	2.035	8 31 44.90	132.30	14 29 53.0	599.7	66.36	15 29.6	56 45.9	II. S.
23	L	4 49.52	1.960	8 57 44.68	127.76	12 25 49.8	639.0	65.20	15 22.3	56 19.2	
23	U	17 12.63	1.894	9 22 53.29	123.78	10 14 56.3	668.3	64.16	15 15.6	55 54.4	II. S.
24	L	5 35.01	1.838	9 47 17.93	120.45	+ 7 59 5.1	-688.9	63.27	15 9.4	55 31.8	
24	U	17 56.78	1.793	10 11 6.26	117.73	5 39 54.3	701.7	62.54	15 3.9	55 11.6	II. S.
25	L	6 18.08	1.759	10 34 26.09	115.68	3 18 50.6	707.7	61.97	14 59.1	54 54.0	
25	U	18 39.04	1.736	10 57 25.19	114.28	+ 0 57 11.1	707.7	61.57	14 55.0	54 39.0	II. S.
26	L	6 59.78	1.722	11 20 11.19	113.49	- 1 23 53.1	-702.0	61.34	14 51.7	54 26.7	
26	U	19 20.42	1.719	11 42 51.42	113.30	3 43 15.7	690.8	61.26	14 49.0	54 17.0	II. S.
27	L	7 41.08	1.726	12 5 32.90	113.70	5 59 51.8	674.2	61.34	14 47.1	54 9.9	
27	U	20 1.88	1.741	12 28 22.31	114.63	8 12 36.9	652.3	61.57	14 45.9	54 5.3	II. S.
28	L	8 22.91	1.765	12 51 25.81	116.04	-10 20 24.5	-624.6	61.93	14 45.3	54 3.1	
28	U	20 44.26	1.796	13 14 49.06	117.91	12 22 5.0	591.0	62.40	14 45.3	54 3.2	II. S.
29	L	9 6.03	1.833	13 38 37.01	120.14	14 16 25.2	551.2	62.97	14 45.9	54 5.4	
29	U	21 28.28	1.875	14 2 53.79	122.69	16 2 7.8	504.8	63.62	14 47.0	54 9.5	II. S.
30	L	9 51.06	1.921	14 27 42.50	125.45	-17 37 51.4	-451.3	64.32	14 48.6	54 15.3	
30	U	22 14.40	1.969	14 53 4.91	128.30	19 2 12.1	390.9	65.04	14 50.6	54 22.7	II. S.
Dec. 1	L	10 38.30	2.015	15 19 1.43	131.11	20 13 46.5	323.6	65.75	14 53.0	54 31.5	
1	U	23 2.75	2.059	15 45 30.83	133.76	21 11 12.5	249.7	66.42	14 55.7	54 41.5	
2	L	11 27.70	2.098	16 12 30.23	136.08	-21 53 14.7	-169.8	67.01	14 58.7	54 52.5	
2	U	23 53.08	2.130	16 39 55.10	137.98	22 18 47.3	- 85.0	67.49	15 2.0	55 4.4	
3	L	12 18.78	2.152	17 7 39.60	139.34	22 26 58.9	+ 3.5	67.84	15 5.4	55 17.0	
4	U	0 44.69	2.165	17 35 36.92	140.11	22 17 15.2	94.0	68.04	15 9.0	55 30.3	
4	L	13 10.70	2.168	18 3 39.87	140.28	-21 49 22.3	+184.8	68.10	15 12.8	55 44.1	
5	U	1 36.68	2.161	18 31 41.41	139.89	21 3 27.3	274.0	68.03	15 16.7	55 58.5	I. S.
5	L	14 2.54	2.147	18 59 35.31	139.02	19 59 57.8	360.2	67.84	15 20.7	56 13.2	
6	U	2 28.19	2.127	19 27 16.67	137.82	18 39 41.2	441.7	67.56	15 24.8	56 28.4	I. S.
6	L	14 53.57	2.104	19 54 42.20	136.42	-17 3 40.2	+517.4	67.24	15 29.1	56 44.0	
7	U	3 18.67	2.079	20 21 50.44	134.96	15 13 12.0	586.1	66.91	15 33.5	57 0.0	I. S.
7	L	15 43.48	2.057	20 48 41.75	133.62	13 9 43.2	647.3	66.60	15 37.9	57 16.3	
8	U	4 8.05	2.030	21 15 18.24	132.52	10 54 48.9	700.3	66.34	15 42.4	57 32.9	I. S.
8	L	16 32.44	2.026	21 41 43.58	131.78	- 8 30 9.9	+744.7	66.17	15 47.0	57 49.8	

Nov. 17, U Defective Illumination of II. 0°.03.
Nov. 17, U Defective Illumination of S. 0°.06.

Nov. 18, U Defective Illumination of S. 0°.48.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- Pass- ing Mer- idian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	" "	" "	
Dec. 9	U	4 56.72	2.022	22 8 2.72	131.51	- 5 57 32.4	+780.0	66.12	15 51.7	58 6.9	I. S.
9	L	17 21.00	2.026	22 34 21.70	131.76	3 18 47.7	805.8	66.20	15 56.4	58 24.1	
10	U	5 45.39	2.040	23 0 47.33	132.62	- 0 35 53.3	821.5	66.43	16 1.0	58 41.1	I. S.
10	L	18 10.01	2.065	23 27 27.04	134.11	+ 2 9 5.9	826.5	66.81	16 5.5	58 57.7	
11	U	6 34.99	2.100	23 54 28.46	136.23	+ 4 53 56.4	+819.9	67.35	16 9.9	59 13.6	I. S.
11	L	19 0.46	2.146	0 21 59.12	138.98	7 36 13.7	800.8	68.03	16 13.9	59 28.5	
12	U	7 26.54	2.201	0 50 6.07	142.27	10 13 22.5	768.3	68.84	16 17.6	59 42.0	I. S.
12	L	19 53.31	2.263	1 18 55.29	146.00	12 42 35.8	721.4	69.75	16 20.8	59 53.6	
13	U	8 20.86	2.329	1 48 31.05	149.98	+15 0 57.3	+659.6	70.70	16 23.3	60 2.9	I. S.
13	L	20 49.21	2.396	2 18 55.14	154.01	17 5 25.9	582.6	71.65	16 25.1	60 9.4	
14	U	9 18.35	2.458	2 50 6.26	157.77	18 53 2.9	491.2	72.52	16 26.0	60 12.7	I. S.
14	L	21 48.18	2.511	3 21 59.27	160.94	20 21 1.5	386.6	73.24	16 25.9	60 12.6	
15	U	10 18.55	2.549	3 54 25.12	163.20	+21 26 59.5	+271.6	73.74	16 24.9	60 8.9	I. S.
15	L	22 49.26	2.566	4 27 11.06	164.25	22 9 11.9	149.7	73.97	16 22.9	60 1.3	
16	U	11 20.05	2.561	5 0 1.69	163.95	22 26 41.1	+ 25.1	73.89	16 19.8	59 50.0	I. N.S.
16	L	23 50.64	2.533	5 32 40.40	162.27	22 19 23.7	- 97.4	73.49	16 15.7	59 35.2	
17	U	12 20.77	2.484	6 4 51.17	159.32	+21 48 9.4	-213.7	72.79	16 10.8	59 17.2	II. N.S.
18	L	0 50.20	2.418	6 36 20.12	155.35	20 54 35.1	320.2	71.85	16 5.2	58 56.4	
18	U	13 18.76	2.340	7 6 56.80	150.67	19 40 53.5	414.5	70.73	15 58.9	58 33.5	II. S.
19	L	1 46.34	2.256	7 36 34.55	145.58	18 9 40.0	495.4	69.51	15 52.2	58 8.9	
19	U	14 12.90	2.170	8 5 10.57	140.42	+16 23 40.2	-562.3	68.25	15 45.2	57 43.3	II. S.
20	L	2 38.44	2.087	8 32 45.36	135.42	14 25 38.0	615.8	67.01	15 38.2	57 17.4	
20	U	15 3.01	2.010	8 59 22.08	130.77	12 18 9.1	657.0	65.84	15 31.1	56 51.6	II. S.
21	L	3 26.70	1.941	9 25 5.84	126.61	10 3 35.9	686.9	64.78	15 24.4	56 26.6	
21	U	15 49.62	1.881	9 50 3.01	123.02	+ 7 44 5.3	-706.7	63.86	15 17.9	56 2.8	II. S.
22	L	4 11.89	1.832	10 14 20.73	120.05	5 21 29.4	718.0	63.09	15 11.8	55 40.6	
22	U	16 33.62	1.793	10 38 6.58	117.71	2 57 25.9	721.5	62.48	15 6.3	55 20.4	II. S.
23	L	4 54.95	1.764	11 1 28.23	116.01	+ 0 33 20.7	718.4	62.03	15 1.4	55 2.5	
23	U	17 16.01	1.747	11 24 33.33	114.94	- 1 49 29.7	-709.2	61.75	14 57.2	54 47.0	II. S.
24	L	5 36.91	1.739	11 47 29.36	114.50	4 9 56.0	694.4	61.64	14 53.7	54 34.1	
24	U	17 57.79	1.741	12 10 23.54	114.64	6 26 53.2	674.3	61.68	14 51.0	54 24.0	II. S.
25	L	6 18.75	1.753	12 33 22.80	115.34	8 39 18.2	649.0	61.87	14 49.0	54 16.7	
25	U	18 39.90	1.773	12 56 33.67	116.56	-10 46 8.6	-618.5	62.19	14 47.7	54 12.2	II. S.
26	L	7 1.34	1.802	13 20 2.22	118.27	12 46 19.8	582.5	62.64	14 47.2	54 10.4	
26	U	19 23.17	1.838	13 43 53.88	120.41	14 38 44.5	540.7	63.20	14 47.5	54 11.4	II. S.
27	L	7 45.47	1.879	14 8 13.39	122.90	16 22 11.0	492.7	63.84	14 48.5	54 14.9	
27	U	20 8.28	1.925	14 33 4.44	125.65	-17 55 23.9	-438.3	64.54	14 50.1	54 20.8	II. S.
28	L	8 31.67	1.973	14 58 29.62	128.56	19 17 4.4	377.3	65.27	14 52.3	54 29.0	
28	U	20 55.64	2.022	15 24 30.07	131.50	20 25 51.3	309.4	66.00	14 55.1	54 39.3	II. S.
29	L	9 20.19	2.069	15 51 5.34	134.34	21 20 23.7	234.9	66.70	14 58.4	54 51.3	
29	U	21 45.28	2.112	16 18 13.21	136.92	-21 59 24.6	-154.3	67.33	15 2.1	55 4.9	II. S.
30	L	10 10.85	2.148	16 45 49.77	139.10	22 21 44.9	- 68.4	67.85	15 6.2	55 19.8	
30	U	22 36.80	2.176	17 13 49.48	140.76	22 26 28.0	+ 21.6	68.24	15 10.5	55 35.6	II. S.
31	L	11 3.02	2.193	17 42 5.60	141.83	22 12 53.9	114.2	68.49	15 15.0	55 52.1	
31	U	23 29.40	2.201	18 10 30.69	142.25	-21 40 43.0	+207.5	68.58	15 19.6	56 9.0	

Dec. 16, U Defective Illumination of N. 0° 20.

Dec. 17, U Defective Illumination of N. 0° 20.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	" ' "	"	" s			h m	h m s	" ' "	"	" s	
Jan. 1	0 19	19 1 38.33	-20 26 42.6	12.9	4.9	0.35	Feb. 15	23 6	20 48 56.04	-19 31 22.3	6.8	2.6	0.18
2	0 10	18 55 59.75	20 18 41.6	13.0	5.0	0.35	16	23 8	20 55 19.04	19 10 28.9	6.8	2.6	0.18
3	0 0	18 50 12.76	20 12 2.4	13.1	5.0	0.35	17	23 10	21 1 43.80	18 48 15.6	6.7	2.6	0.18
3 23 51	18 44 28.35	20 6 47.2	13.1	5.0	0.35	18	23 13	21 8 10.25	18 24 42.2	6.7	2.5	0.18	
4 23 41	18 38 56.95	20 2 58.3	13.0	4.9	0.35	19	23 15	21 14 38.32	17 59 48.4	6.7	2.5	0.18	
5 23 32	18 33 47.75	-20 0 36.7	12.9	4.9	0.35	20	23 18	21 21 7.93	-17 33 34.0	6.6	2.5	0.18	
6 23 23	18 29 8.36	19 59 43.5	12.8	4.8	0.35	21	23 21	21 27 39.04	17 5 58.9	6.6	2.5	0.17	
7 23 15	18 25 4.42	20 0 17.7	12.6	4.8	0.34	22	23 23	21 34 11.60	16 37 3.0	6.6	2.5	0.17	
8 23 8	18 21 39.67	20 2 16.8	12.4	4.7	0.33	23	23 26	21 40 45.58	16 6 46.2	6.5	2.5	0.17	
9 23 2	18 18 56.15	20 5 35.6	12.1	4.6	0.33	24	23 28	21 47 21.00	15 35 8.7	6.5	2.5	0.17	
10 22 56	18 16 54.38	-20 10 7.6	11.8	4.5	0.32	25	23 31	21 53 57.83	-15 2 10.2	6.5	2.5	0.17	
11 22 50	18 15 33.75	20 15 44.8	11.6	4.4	0.31	26	23 34	22 0 36.09	14 27 50.9	6.5	2.5	0.17	
12 22 46	18 14 52.75	20 22 17.6	11.3	4.3	0.31	27	23 36	22 7 15.79	13 52 10.8	6.5	2.4	0.17	
13 22 42	18 14 49.36	20 29 36.0	11.1	4.2	0.30	28	23 39	22 13 56.97	13 15 10.4	6.4	2.4	0.17	
14 22 38	18 15 21.17	20 37 29.5	10.8	4.1	0.30	Mar. 1	23 42	22 20 39.65	12 36 49.7	6.4	2.4	0.17	
15 22 35	18 16 25.63	-20 45 47.8	10.6	4.0	0.29	2	23 45	22 27 23.88	-11 57 9.5	6.4	2.4	0.17	
16 22 33	18 18 0.13	20 54 20.9	10.3	3.9	0.28	3	23 48	22 34 9.70	11 16 9.7	6.4	2.4	0.17	
17 22 31	18 20 2.16	21 2 59.5	10.1	3.8	0.28	4	23 50	22 40 57.17	10 33 51.3	6.4	2.4	0.16	
18 22 30	18 22 29.27	21 11 34.4	9.9	3.8	0.27	5	23 53	22 47 46.33	9 50 15.1	6.4	2.4	0.16	
19 22 29	18 25 19.20	21 19 57.8	9.7	3.7	0.26	6	23 56	22 54 37.21	9 5 21.8	6.4	2.4	0.16	
20 22 28	18 28 29.82	-21 28 1.6	9.5	3.6	0.26	7	23 59	23 1 29.87	-8 19 13.1	6.4	2.4	0.16	
21 22 27	18 31 59.24	21 35 39.6	9.3	3.5	0.25	9	0 2	23 8 24.32	7 31 50.3	6.4	2.4	0.16	
22 22 27	18 35 45.69	21 42 45.2	9.1	3.5	0.25	10	0 5	23 15 20.58	6 43 15.3	6.4	2.5	0.16	
23 22 27	18 39 47.57	21 49 13.2	8.9	3.4	0.24	11	0 8	23 22 18.64	5 53 30.3	6.5	2.5	0.16	
24 22 28	18 44 3.43	21 54 58.5	8.8	3.3	0.24	12	0 11	23 29 18.47	5 2 38.1	6.5	2.5	0.16	
25 22 28	18 48 31.99	-21 59 56.8	8.6	3.3	0.24	13	0 14	23 36 19.99	-4 10 42.0	6.5	2.5	0.17	
26 22 29	18 53 12.08	22 4 3.9	8.5	3.2	0.23	14	0 17	23 43 23.10	3 17 46.0	6.5	2.5	0.17	
27 22 30	18 58 2.63	22 7 16.7	8.4	3.2	0.23	15	0 20	23 50 27.62	2 23 54.6	6.6	2.5	0.17	
28 22 31	19 3 2.70	22 9 31.7	8.2	3.1	0.23	16	0 24	23 57 33.32	1 29 13.1	6.6	2.5	0.17	
29 22 32	19 8 11.44	22 10 46.5	8.1	3.1	0.22	17	0 27	0 4 39.93	-0 33 48.0	6.7	2.5	0.17	
30 22 33	19 13 28.04	-22 10 58.2	8.0	3.0	0.22	18	0 30	0 11 47.03	+0 22 13.5	6.7	2.5	0.17	
31 22 35	19 18 51.86	22 10 5.2	7.9	3.0	0.22	19	0 33	0 18 54.16	1 18 43.0	6.8	2.6	0.17	
Feb. 1	22 36	19 24 22.24	22 8 5.1	7.8	3.0	0.21	20	0 36	0 26 0.74	2 15 31.2	6.9	2.6	0.17
2	22 38	19 29 58.62	22 4 56.2	7.7	2.9	0.21	21	0 39	0 33 6.07	3 12 27.6	6.9	2.6	0.18
3	22 40	19 35 40.46	22 0 37.3	7.6	2.9	0.21	22	0 42	0 40 9.33	4 9 20.5	7.0	2.7	0.18
4	22 42	19 41 27.33	-21 55 6.7	7.5	2.9	0.21	23	0 46	0 47 9.59	+5 5 57.2	7.1	2.7	0.18
5	22 43	19 47 18.77	21 48 23.2	7.4	2.8	0.20	24	0 49	0 54 5.80	6 2 4.6	7.2	2.7	0.18
6	22 45	19 53 14.42	21 40 26.0	7.3	2.8	0.20	25	0 51	1 0 56.80	6 57 28.2	7.3	2.8	0.19
7	22 47	19 59 13.92	21 31 14.0	7.3	2.8	0.20	26	0 54	1 7 41.33	7 51 53.7	7.5	2.8	0.19
8	22 50	20 5 16.95	21 20 46.4	7.2	2.7	0.20	27	0 57	1 14 18.05	8 45 6.1	7.6	2.9	0.19
9	22 52	20 11 23.22	-21 9 2.3	7.1	2.7	0.19	28	0 59	1 20 45.56	+9 36 50.9	7.8	3.0	0.20
10	22 54	20 17 32.48	20 56 1.3	7.1	2.7	0.19	29	1 2	1 27 2.47	10 26 53.9	8.0	3.0	0.20
11	22 56	20 23 44.48	20 41 42.6	7.0	2.7	0.19	30	1 4	1 33 7.31	11 15 1.7	8.1	3.1	0.21
12	22 58	20 29 59.03	20 26 5.7	7.0	2.6	0.19	31	1 6	1 38 58.71	12 1 1.5	8.3	3.2	0.21
13	23 1	20 36 15.92	20 9 10.4	6.9	2.6	0.19	Apr. 1	1 7	1 44 35.27	12 44 42.0	8.5	3.2	0.22
14	23 3	20 42 34.97	-19 50 56.0	6.9	2.6	0.19	2	1 9	1 49 55.71	+13 25 52.9	8.8	3.3	0.23
15	23 6	20 48 56.04	-19 31 22.3	6.8	2.6	0.18	3	1 10	1 54 58.80	+14 4 25.1	9.0	3.4	0.23

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.
	h m	h m s	" "	" "	s		h m	h m s	" "	" "	s
pr. 1	1 7	1 44 35.27	+12 44 42.0	8.5	3.2 0.22	May 16	22 27	2 5 20.68	+ 9 11 41.5	12.4	4.7 0.32
2	1 9	1 49 55.71	13 25 52.9	8.8	3.3 0.23	17	22 26	2 7 35.85	9 19 31.4	12.1	4.6 0.31
3	1 10	1 54 58.80	14 4 25.1	9.0	3.4 0.23	18	22 24	2 10 4.94	9 29 25.9	11.9	4.5 0.31
4	1 11	1 59 43.39	14 40 11.0	9.3	3.5 0.24	19	22 23	2 12 47.58	9 41 19.5	11.7	4.4 0.30
5	1 11	2 4 8.43	15 13 3.6	9.5	3.6 0.25	20	22 22	2 15 43.47	9 55 7.0	11.4	4.3 0.29
6	1 11	2 8 12.98	+15 42 57.3	9.8	3.7 0.26	21	22 21	2 18 52.29	+10 10 43.0	11.2	4.3 0.29
7	1 11	2 11 56.20	16 9 47.7	10.1	3.8 0.26	22	22 21	2 22 13.79	10 28 1.9	11.0	4.2 0.28
8	1 11	2 15 17.34	16 33 30.3	10.4	3.9 0.27	23	22 20	2 25 47.70	10 46 57.9	10.7	4.1 0.28
9	1 10	2 18 15.79	16 54 2.2	10.7	4.0 0.28	24	22 20	2 29 33.84	11 7 26.0	10.5	4.0 0.27
10	1 8	2 20 51.04	17 11 20.5	11.0	4.2 0.29	25	22 20	2 33 32.03	11 29 20.4	10.3	3.9 0.27
11	1 7	2 23 2.74	+17 25 22.8	11.3	4.3 0.30	26	22 20	2 37 42.15	+11 52 35.7	10.1	3.8 0.26
12	1 4	2 24 50.65	17 36 7.5	11.7	4.4 0.31	27	22 21	2 42 4.11	12 17 6.5	9.9	3.8 0.26
13	1 2	2 26 14.74	17 43 33.8	12.0	4.6 0.32	28	22 21	2 46 37.82	12 42 47.3	9.7	3.7 0.25
14	0 59	2 27 15.12	17 47 40.9	12.3	4.7 0.33	29	22 22	2 51 23.32	13 9 32.7	9.5	3.6 0.25
15	0 56	2 27 52.11	17 48 29.5	12.7	4.8 0.33	30	22 23	2 56 20.58	13 37 17.2	9.3	3.5 0.24
16	0 52	2 28 6.25	+17 46 0.8	13.0	4.9 0.34	31	22 24	3 1 29.68	+14 5 55.1	9.1	3.5 0.24
17	0 48	2 27 58.34	17 40 17.4	13.3	5.1 0.34	June 1	22 26	3 6 50.69	14 35 20.7	8.9	3.4 0.23
18	0 43	2 27 29.42	17 31 23.7	13.6	5.2 0.35	2	22 27	3 12 23.72	15 5 27.9	8.8	3.3 0.23
19	0 39	2 26 40.78	17 19 25.4	14.0	5.3 0.36	3	22 29	3 18 8.93	15 36 10.8	8.6	3.3 0.23
20	0 34	2 25 34.00	17 43 11.1	14.2	5.4 0.37	4	22 31	3 24 6.44	16 7 22.9	8.5	3.2 0.22
21	0 28	2 24 10.88	+16 46 50.5	14.5	5.5 0.38	5	22 33	3 30 16.49	+16 38 57.7	8.3	3.2 0.22
22	0 23	2 22 33.48	16 26 36.5	14.8	5.6 0.39	6	22 36	3 36 39.22	17 10 48.1	8.2	3.1 0.22
23	0 17	2 20 44.07	16 4 41.1	15.0	5.7 0.39	7	22 38	3 43 14.86	17 42 46.3	8.0	3.0 0.21
24	0 11	2 18 45.10	15 39 30.9	15.2	5.8 0.40	8	22 41	3 50 3.57	18 14 44.7	7.9	3.0 0.21
25	0 5	2 16 39.11	15 13 16.5	15.3	5.8 0.40	9	22 44	3 57 5.56	18 46 34.9	7.8	3.0 0.21
25	23 59	2 14 28.75	+14 45 42.4	15.5	5.9 0.40	10	22 48	4 4 20.94	+19 18 7.9	7.7	2.9 0.21
26	23 53	2 12 16.62	14 17 11.5	15.6	5.9 0.41	11	22 51	4 11 49.80	19 49 14.0	7.5	2.9 0.20
27	23 47	2 10 5.36	13 48 7.5	15.6	5.9 0.41	12	22 55	4 19 32.19	20 19 43.0	7.4	2.8 0.20
28	23 41	2 7 57.42	13 18 54.6	15.6	5.9 0.41	13	22 59	4 27 28.03	20 49 24.2	7.3	2.8 0.20
29	23 35	2 5 55.15	12 49 56.6	15.6	5.9 0.41	14	23 3	4 35 37.16	21 18 5.9	7.2	2.7 0.20
30	23 29	2 4 0.68	+12 21 36.2	15.6	5.9 0.40	15	23 8	4 43 59.30	+21 45 36.7	7.1	2.7 0.19
May 1	23 23	2 2 15.91	11 54 14.5	15.5	5.9 0.40	16	23 12	4 52 34.00	22 11 44.4	7.0	2.7 0.19
2	23 18	2 0 42.48	11 28 11.0	15.4	5.8 0.40	17	23 17	5 1 20.64	22 36 16.4	7.0	2.7 0.19
3	23 12	1 59 21.82	11 3 43.1	15.3	5.8 0.40	18	23 22	5 10 18.46	22 59 0.6	6.9	2.6 0.19
4	23 7	1 58 15.05	10 41 5.4	15.2	5.8 0.39	19	23 27	5 19 26.47	23 19 44.9	6.8	2.6 0.19
5	23 3	1 57 23.10	+10 20 30.2	15.0	5.7 0.39	20	23 32	5 28 43.52	+23 38 18.0	6.8	2.6 0.19
6	22 58	1 56 46.59	10 2 7.5	14.8	5.6 0.38	21	23 38	5 38 8.28	23 54 29.3	6.7	2.6 0.19
7	22 54	1 56 26.00	9 46 4.4	14.6	5.5 0.38	22	23 43	5 47 39.29	24 8 9.9	6.7	2.5 0.19
8	22 50	1 56 21.60	9 32 26.6	14.4	5.4 0.37	23	23 49	5 57 14.93	24 19 12.0	6.7	2.5 0.18
9	22 46	1 56 33.50	9 21 16.9	14.1	5.4 0.36	24	23 55	6 6 53.55	24 27 29.4	6.7	2.5 0.18
10	22 43	1 57 1.69	+ 9 12 36.9	13.9	5.3 0.36	26	0 1	6 16 33.44	+24 32 57.8	6.6	2.5 0.18
11	22 39	1 57 46.02	9 6 26.7	13.6	5.2 0.35	27	0 6	6 26 12.88	24 35 35.8	6.6	2.5 0.18
12	22 36	1 58 46.28	9 2 44.6	13.4	5.1 0.35	28	0 12	6 35 50.20	24 35 22.5	6.6	2.5 0.18
13	22 34	2 0 2.20	9 1 28.7	13.1	5.0 0.34	29	0 17	6 45 23.87	24 32 19.9	6.6	2.5 0.18
14	22 31	2 1 33.48	9 2 35.5	12.9	4.9 0.33	30	0 23	6 54 52.42	24 26 31.1	6.7	2.5 0.18
15	22 29	2 3 19.76	+ 9 6 1.2	12.6	4.8 0.32	July 1	0 28	7 4 14.56	+24 18 0.6	6.7	2.5 0.19
16	22 27	2 5 20.68	+ 9 11 41.5	12.4	4.7 0.32	2	0 34	7 13 29.12	+24 6 54.7	6.7	2.5 0.19

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
July	h m	h m s	" " "	" "	" "	s	Aug. 16	h m	h m s	" " "	" "	" "	s
1	0 28	7 4 14.56	+24 18 0.6	6.7	2.5	0.19	1	1 28	11 5 3.48	+1 58 12.6	12.1	4.6	0.30
2	0 34	7 13 29.12	24 6 54.7	6.7	2.5	0.19	17	1 24	11 5 29.37	1 44 58.2	12.3	4.7	0.31
3	0 39	7 22 35.16	23 53 20.2	6.7	2.6	0.19	18	1 20	11 5 36.86	1 34 14.9	12.5	4.7	0.32
4	0 44	7 31 31.84	23 37 24.7	6.8	2.6	0.19	19	1 16	11 5 25.41	1 26 13.0	12.7	4.8	0.32
5	0 49	7 40 18.46	23 19 16.3	6.8	2.6	0.19	20	1 12	11 4 54.58	1 21 2.5	12.9	4.9	0.32
6	0 53	7 48 54.56	+22 59 3.4	6.9	2.6	0.19	21	1 7	11 4 4.09	+1 18 52.8	13.1	5.0	0.33
7	0 58	7 57 19.70	22 36 54.7	6.9	2.6	0.19	22	1 2	11 2 53.86	1 19 52.5	13.3	5.0	0.33
8	1 2	8 5 53.63	22 12 58.6	7.0	2.6	0.19	23	0 56	11 1 24.07	1 24 8.6	13.5	5.1	0.34
9	1 6	8 13 36.16	21 47 23.2	7.0	2.7	0.19	24	0 51	10 59 35.15	1 31 46.8	13.6	5.2	0.34
10	1 10	8 21 27.17	21 20 17.1	7.1	2.7	0.19	25	0 45	10 57 27.92	1 42 50.2	13.8	5.2	0.35
11	1 14	8 29 6.69	+20 51 48.3	7.1	2.7	0.19	26	0 38	10 55 3.65	+1 57 18.3	13.9	5.3	0.35
12	1 17	8 36 34.71	20 22 4.3	7.2	2.7	0.19	27	0 32	10 52 23.97	2 15 7.5	14.0	5.3	0.35
13	1 21	8 43 51.33	19 51 12.3	7.3	2.8	0.20	28	0 25	10 49 31.07	2 36 9.4	14.1	5.3	0.36
14	1 24	8 50 56.64	19 19 19.4	7.4	2.8	0.20	29	0 18	10 46 27.54	3 0 11.8	14.1	5.3	0.36
15	1 27	8 57 50.79	18 46 32.4	7.4	2.8	0.20	30	0 11	10 43 16.56	3 26 56.7	14.1	5.3	0.36
16	1 29	9 4 33.92	+18 12 57.6	7.5	2.9	0.20	31	0	4 10 40 1.65	+3 56 1.5	14.0	5.3	0.36
17	1 32	9 11 6.20	17 38 41.0	7.6	2.9	0.20	31	23 57	10 36 46.73	4 26 59.1	14.0	5.3	0.36
18	1 34	9 17 27.75	17 3 48.4	7.7	2.9	0.20	Sept. 1	23 49	10 33 35.97	4 59 18.1	13.8	5.3	0.35
19	1 37	9 23 38.75	16 28 25.4	7.8	3.0	0.21	2	23 43	10 30 33.71	5 32 24.6	13.7	5.2	0.35
20	1 39	9 29 39.38	15 52 37.0	7.9	3.0	0.21	3	23 36	10 27 44.27	6 5 42.5	13.5	5.1	0.34
21	1 41	9 35 29.77	+15 16 28.7	8.0	3.0	0.21	4	23 29	10 25 11.85	+6 38 34.9	13.3	5.0	0.34
22	1 42	9 41 10.00	14 40 5.1	8.1	3.1	0.21	5	23 23	10 23 0.39	7 10 25.3	13.0	4.9	0.33
23	1 44	9 46 40.23	14 3 31.0	8.2	3.1	0.22	6	23 18	10 21 13.43	7 40 39.0	12.7	4.8	0.32
24	1 45	9 52 0.52	13 26 51.0	8.3	3.2	0.22	7	23 12	10 19 54.04	8 8 43.8	12.4	4.7	0.32
25	1 47	9 57 10.95	12 50 9.5	8.4	3.2	0.22	8	23 8	10 19 4.73	8 34 11.0	12.1	4.6	0.31
26	1 48	10 2 11.59	+12 13 31.1	8.6	3.2	0.22	9	23 3	10 18 47.40	+8 56 35.1	11.8	4.5	0.30
27	1 48	10 7 2.42	11 37 0.0	8.7	3.3	0.23	10	23 0	10 19 3.36	9 15 35.0	11.4	4.3	0.29
28	1 49	10 11 43.47	11 0 40.3	8.8	3.3	0.23	11	22 56	10 19 53.32	9 30 53.5	11.1	4.2	0.29
29	1 50	10 16 14.66	10 24 36.7	8.9	3.4	0.23	12	22 54	10 21 17.33	9 42 17.6	10.7	4.1	0.28
30	1 50	10 20 35.95	9 48 53.7	9.1	3.5	0.23	13	22 52	10 23 14.97	9 49 37.9	10.4	4.0	0.27
31	1 50	10 24 47.21	+ 9 13 35.4	9.2	3.5	0.24	14	22 51	10 25 45.29	+9 52 49.0	10.1	3.8	0.26
Aug. 1	1 50	10 28 48.32	8 38 46.3	9.4	3.6	0.24	15	22 50	10 28 46.89	9 51 48.8	9.8	3.7	0.25
2	1 50	10 32 39.09	8 4 31.4	9.5	3.6	0.24	16	22 49	10 32 18.02	9 46 38.3	9.5	3.6	0.24
3	1 50	10 36 19.30	7 30 55.3	9.7	3.7	0.25	17	22 49	10 36 16.62	9 37 22.1	9.2	3.5	0.24
4	1 50	10 39 48.70	6 58 3.2	9.8	3.7	0.25	18	22 50	10 40 40.39	9 24 6.9	8.9	3.4	0.23
5	1 49	10 43 6.99	+ 6 26 0.3	10.0	3.8	0.26	19	22 51	10 45 26.91	+9 7 2.5	8.7	3.3	0.22
6	1 48	10 46 13.79	5 54 52.2	10.2	3.9	0.26	20	22 52	10 50 33.64	8 46 20.6	8.5	3.2	0.22
7	1 47	10 49 8.73	5 24 44.4	10.3	3.9	0.26	21	22 53	10 55 58.05	8 22 14.7	8.2	3.1	0.21
8	1 46	10 51 51.36	4 55 43.5	10.5	4.0	0.27	22	22 55	11 1 137.65	7 54 59.7	8.0	3.1	0.21
9	1 45	10 54 21.22	4 27 55.8	10.7	4.1	0.27	23	22 57	11 7 30.09	7 24 51.4	7.9	3.0	0.20
10	1 43	10 56 37.77	+ 4 128.5	10.9	4.1	0.27	24	22 59	11 13 33.11	+6 52 6.2	7.7	2.9	0.20
11	1 41	10 58 40.44	3 36 28.7	11.1	4.2	0.28	25	23 1	11 19 44.67	6 17 0.7	7.5	2.9	0.19
12	1 39	11 0 28.63	3 13 4.3	11.3	4.3	0.28	26	23 4	11 26 2.96	5 39 51.0	7.4	2.8	0.19
13	1 36	11 2 1.69	2 51 23.4	11.5	4.4	0.29	27	23 6	11 32 26.33	5 0 52.8	7.3	2.8	0.18
14	1 34	11 3 18.97	2 31 35.0	11.7	4.4	0.29	28	23 8	11 38 53.36	4 20 21.3	7.1	2.7	0.18
15	1 31	11 4 19.81	+ 2 13 48.2	11.9	4.5	0.30	29	23 11	11 45 22.84	+3 38 30.9	7.0	2.7	0.18
16	1 28	11 5 3.48	+ 1 58 12.6	12.1	4.6	0.30	30	23 14	11 51 53.77	+2 55 34.2	6.9	2.6	0.18

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidian. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidian. S. T. of Sem. Pass. Mer.
	h m	h m s	" "	" "	" s		h m	h m s	" "	" "	" s
Sept. 30	23 14	11 51 53.77	+ 2 55 34.2	6.9	2.6 0.18	Nov. 16	0 58	16 38 7.80	-24 24 21.2	7.0	2.7 0.19
Oct. 1	23 16	11 58 25.30	2 11 43.9	6.8	2.6 0.17	17	1 0	16 44 15.74	24 38 54.9	7.1	2.7 0.20
2	23 19	12 4 56.76	1 27 10.7	6.8	2.6 0.17	18	1 2	16 50 21.73	24 52 10.5	7.1	2.7 0.20
3	23 21	12 11 27.60	+ 0 42 4.7	6.7	2.5 0.17	19	1 5	16 56 25.27	25 4 7.0	7.2	2.8 0.20
4	23 24	12 17 57.41	- 0 3 25.2	6.6	2.5 0.17	20	1 7	17 2 25.73	25 14 42.8	7.3	2.8 0.20
5	23 26	12 24 25.89	- 0 49 10.9	6.5	2.5 0.17	21	1 9	17 8 22.44	-25 23 56.7	7.4	2.8 0.21
6	23 29	12 30 52.80	1 35 5.3	6.5	2.5 0.16	22	1 11	17 14 14.62	25 31 47.2	7.6	2.9 0.21
7	23 31	12 37 18.01	2 21 1.9	6.4	2.4 0.16	23	1 12	17 20 1.34	25 38 13.4	7.7	2.9 0.21
8	23 34	12 43 41.44	3 6 54.9	6.4	2.4 0.16	24	1 14	17 25 41.60	25 43 14.2	7.8	3.0 0.22
9	23 36	12 50 3.04	3 52 39.3	6.4	2.4 0.16	25	1 16	17 31 14.23	25 46 49.3	7.9	3.0 0.22
10	23 39	12 56 22.84	- 4 38 10.7	6.3	2.4 0.16	26	1 17	17 36 37.89	-25 48 57.7	8.1	3.1 0.23
11	23 41	13 2 40.88	5 23 25.1	6.3	2.4 0.16	27	1 18	17 41 51.10	25 49 39.4	8.2	3.1 0.23
12	23 43	13 8 57.24	6 8 18.9	6.3	2.4 0.16	28	1 19	17 46 52.15	25 48 54.0	8.4	3.2 0.24
13	23 45	13 15 11.98	6 52 48.9	6.2	2.4 0.16	29	1 20	17 51 39.13	25 46 42.5	8.6	3.3 0.24
14	23 48	13 21 25.24	7 36 52.4	6.2	2.4 0.16	30	1 21	17 56 9.88	25 43 4.8	8.8	3.3 0.25
15	23 50	13 27 37.13	- 8 20 26.6	6.2	2.3 0.16	Dec. 1	1 21	18 0 22.00	-25 38 2.4	9.0	3.4 0.25
16	23 52	13 33 47.78	9 3 29.3	6.2	2.3 0.16	2	1 21	18 4 12.85	25 31 36.9	9.2	3.5 0.26
17	23 54	13 39 57.33	9 45 58.5	6.2	2.3 0.16	3	1 21	18 7 39.48	25 23 49.9	9.4	3.6 0.26
18	23 57	13 46 5.92	10 27 52.2	6.2	2.3 0.16	4	1 20	18 10 38.70	25 14 43.7	9.7	3.7 0.27
19	23 59	13 52 13.68	11 9 8.6	6.1	2.3 0.16	5	1 18	18 13 7.16	25 4 21.1	9.9	3.8 0.28
21	0 1	13 58 20.75	-11 49 46.0	6.1	2.3 0.16	6	1 16	18 15 1.26	-24 52 44.8	10.2	3.9 0.28
22	0 3	14 4 27.29	12 29 43.0	6.1	2.3 0.16	7	1 13	18 16 17.39	24 39 58.0	10.5	4.0 0.29
23	0 5	14 10 33.43	13 8 58.1	6.1	2.3 0.16	8	1 10	18 16 52.06	24 26 4.0	10.8	4.1 0.30
24	0 7	14 16 39.27	13 47 30.0	6.2	2.3 0.16	9	1 6	18 16 42.04	24 11 5.7	11.1	4.2 0.31
25	0 10	14 22 44.98	14 25 17.0	6.2	2.3 0.16	10	1 1	18 15 44.70	23 55 6.4	11.4	4.3 0.31
26	0 12	14 28 50.65	-15 2 18.1	6.2	2.3 0.16	11	0 55	18 13 58.35	-23 38 9.6	11.7	4.4 0.32
27	0 14	14 34 56.39	15 38 31.9	6.2	2.3 0.16	12	0 49	18 11 22.65	23 20 19.3	12.0	4.5 0.33
28	0 16	14 41 2.30	16 13 57.3	6.2	2.4 0.16	13	0 42	18 7 58.94	23 1 40.3	12.3	4.6 0.34
29	0 18	14 47 8.50	16 48 32.8	6.2	2.4 0.16	14	0 34	18 3 50.60	22 42 20.1	12.5	4.7 0.34
30	0 20	14 53 15.02	17 22 17.2	6.2	2.4 0.16	15	0 25	17 59 3.19	22 22 29.1	12.7	4.8 0.35
31	0 23	14 59 22.00	-17 55 9.3	6.2	2.4 0.17	16	0 16	17 53 44.62	-22 2 21.9	12.9	4.9 0.35
Nov. 1	0 25	15 5 29.44	18 27 7.9	6.3	2.4 0.17	17	0 6	17 48 4.56	21 42 17.5	13.0	4.9 0.35
2	0 27	15 11 37.41	18 58 11.6	6.3	2.4 0.17	17	23 56	17 42 14.10	21 22 39.9	13.0	4.9 0.35
3	0 29	15 17 45.95	19 28 19.3	6.3	2.4 0.17	18	23 47	17 36 24.82	21 3 56.3	13.0	4.9 0.35
4	0 31	15 23 55.07	19 57 29.5	6.4	2.4 0.17	19	23 37	17 30 48.00	20 46 35.2	12.9	4.9 0.35
5	0 34	15 30 4.76	-20 25 40.9	6.4	2.4 0.17	20	23 28	17 25 33.82	-20 31 3.4	12.8	4.8 0.34
6	0 36	15 36 15.03	20 52 52.2	6.4	2.4 0.17	21	23 19	17 20 50.66	20 17 44.7	12.6	4.8 0.34
7	0 38	15 42 25.82	21 19 1.9	6.5	2.5 0.18	22	23 11	17 16 44.91	20 6 56.2	12.4	4.7 0.34
8	0 40	15 48 37.09	21 44 8.7	6.5	2.5 0.18	23	23 4	17 13 20.76	19 58 49.1	12.1	4.6 0.33
9	0 42	15 54 48.72	22 8 11.1	6.6	2.5 0.18	24	22 57	17 10 40.45	19 53 26.6	11.9	4.5 0.32
10	0 45	16 1 0.64	-22 31 7.7	6.6	2.5 0.18	25	22 51	17 8 44.54	-19 50 46.6	11.6	4.4 0.31
11	0 47	16 7 12.69	22 52 57.1	6.7	2.5 0.18	26	22 46	17 7 32.23	19 50 40.6	11.3	4.3 0.31
12	0 49	16 13 24.73	23 13 37.5	6.7	2.5 0.18	27	22 42	17 7 1.79	19 52 56.8	11.0	4.2 0.30
13	0 51	16 19 36.52	23 33 7.8	6.8	2.6 0.19	28	22 38	17 7 10.85	19 57 20.7	10.8	4.1 0.29
14	0 54	16 25 47.81	23 51 26.1	6.8	2.6 0.19	29	22 35	17 7 56.66	20 3 36.1	10.5	4.0 0.28
15	0 56	16 31 58.36	-24 8 31.2	6.9	2.6 0.19	30	22 32	17 9 16.30	-20 11 26.4	10.2	3.9 0.28
16	0 58	16 38 7.80	-24 24 21.2	7.0	2.7 0.19	31	22 30	17 11 6.88	-20 20 35.1	10.0	3.8 0.27

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	" ' "	" "	" s			h m	h m s	" ' "	" "	" s	
Jan. 1	2 56	21 39 4.10	-13 56 48.0	20.3	19.7	1.35	Feb. 15	23 23	21 6 8.21	-7 47 15.6	31.4	30.5	2.05
2	2 54	21 41 7.65	13 36 8.9	20.6	20.0	1.37	16	23 17	21 4 11.50	7 56 35.8	31.2	30.3	2.04
3	2 53	21 43 4.90	13 15 37.3	20.9	20.3	1.39	17	23 11	21 2 22.26	8 6 12.0	30.9	30.0	2.02
4	2 50	21 44 55.65	12 55 15.2	21.2	20.6	1.41	18	23 6	21 0 41.03	8 16 0.0	30.6	29.7	2.00
5	2 48	21 46 39.73	12 35 4.0	21.6	21.0	1.43	19	23 0	20 59 8.32	8 25 56.1	30.3	29.4	1.98
6	2 46	21 48 16.92	-12 15 5.6	21.9	21.3	1.45	20	22 55	20 57 44.55	8 35 56.3	29.9	29.1	1.96
7	2 44	21 49 47.08	11 55 21.3	22.3	21.6	1.47	21	22 50	20 56 30.05	8 45 57.2	29.6	28.7	1.95
8	2 41	21 51 9.97	11 35 53.3	22.6	22.0	1.50	22	22 45	20 55 25.13	8 55 55.5	29.2	28.4	1.93
9	2 38	21 52 25.41	11 16 43.3	23.0	22.3	1.52	23	22 40	20 54 30.00	9 5 47.7	28.8	28.0	1.90
10	2 35	21 53 33.19	10 57 53.4	23.4	22.7	1.54	24	22 35	20 53 44.77	9 15 31.0	28.4	27.6	1.87
11	2 33	21 54 33.10	-10 39 25.4	23.7	23.1	1.56	25	22 30	20 53 9.54	9 25 2.5	28.0	27.2	1.84
12	2 29	21 55 24.92	10 21 21.4	24.1	23.4	1.59	26	22 26	20 52 44.33	9 34 19.6	27.6	26.8	1.81
13	2 26	21 56 8.46	10 3 43.5	24.5	23.8	1.61	27	22 22	20 52 29.14	9 43 20.2	27.2	26.5	1.79
14	2 23	21 56 43.51	9 46 34.0	24.9	24.2	1.64	28	22 18	20 52 23.88	9 52 2.0	26.8	26.1	1.76
15	2 19	21 57 9.86	9 29 55.2	25.3	24.6	1.66	Mar. 1	22 14	20 52 28.45	10 0 22.6	26.4	25.7	1.74
16	2 16	21 57 27.33	9 13 49.4	25.7	25.0	1.69	2	22 10	20 52 42.71	-10 8 20.8	26.0	25.3	1.71
17	2 12	21 57 35.74	8 58 18.9	26.1	25.4	1.71	3	22 7	20 53 6.48	10 15 54.9	25.6	24.9	1.69
18	2 8	21 57 34.90	8 43 26.0	26.5	25.8	1.74	4	22 3	20 53 39.55	10 23 3.2	25.2	24.5	1.66
19	2 4	21 57 24.72	8 29 13.1	26.9	26.1	1.76	5	22 0	20 54 21.72	10 29 44.7	24.8	24.1	1.63
20	2 0	21 57 5.06	8 15 42.6	27.3	26.5	1.79	6	21 57	20 55 12.73	10 35 58.2	24.4	23.7	1.61
21	1 55	21 56 35.88	8 2 56.7	27.7	26.9	1.81	7	21 54	20 56 12.32	-10 41 42.8	24.0	23.3	1.58
22	1 51	21 55 57.13	7 50 57.7	28.1	27.3	1.84	8	21 51	20 57 20.23	10 46 57.5	23.6	22.9	1.56
23	1 46	21 55 8.83	7 39 47.8	28.5	27.7	1.86	9	21 49	20 58 36.18	10 51 41.5	23.2	22.6	1.53
24	1 41	21 54 11.06	7 29 29.1	28.9	28.1	1.89	10	21 46	20 59 59.90	10 55 54.4	22.8	22.2	1.51
25	1 36	21 53 3.91	7 20 3.5	29.2	28.4	1.91	11	21 44	21 1 31.08	10 59 35.5	22.5	21.8	1.48
26	1 31	21 51 47.58	7 11 32.9	29.6	28.8	1.93	12	21 41	21 3 9.46	-11 2 44.5	22.1	21.5	1.46
27	1 25	21 50 22.29	7 3 58.6	30.0	29.1	1.96	13	21 39	21 4 54.75	11 5 20.9	21.7	21.1	1.43
28	1 20	21 48 48.37	6 57 22.3	30.3	29.4	1.98	14	21 37	21 6 46.68	11 7 24.4	21.4	20.8	1.41
29	1 14	21 47 6.19	6 51 44.9	30.6	29.7	2.00	15	21 35	21 8 44.98	11 8 54.6	21.0	20.4	1.39
30	1 9	21 45 16.21	6 47 7.2	30.9	30.0	2.02	16	21 33	21 10 49.41	11 9 51.3	20.7	20.1	1.37
31	1 3	21 43 18.93	6 43 30.1	31.2	30.3	2.03	17	21 32	21 12 59.70	-11 10 14.3	20.4	19.8	1.35
Feb. 1	0 57	21 41 14.96	6 40 53.7	31.4	30.5	2.05	18	21 30	21 15 15.62	11 10 3.4	20.1	19.5	1.33
2	0 51	21 39 4.96	6 39 17.9	31.6	30.7	2.06	19	21 28	21 17 36.92	11 9 18.5	19.7	19.2	1.30
3	0 44	21 36 49.66	6 38 42.2	31.8	30.9	2.08	20	21 27	21 20 3.39	11 7 59.2	19.4	18.9	1.28
4	0 38	21 34 29.83	6 39 5.5	32.0	31.1	2.09	21	21 25	21 22 34.80	11 6 5.6	19.1	18.6	1.26
5	0 32	21 32 6.33	6 40 26.7	32.1	31.2	2.10	22	21 24	21 25 10.94	-11 3 37.8	18.8	18.3	1.24
6	0 26	21 29 40.04	6 42 44.1	32.2	31.3	2.10	23	21 23	21 27 51.60	11 0 35.6	18.5	18.0	1.22
7	0 19	21 27 11.88	6 45 55.8	32.3	31.4	2.11	24	21 22	21 30 36.57	10 56 59.4	18.3	17.7	1.20
8	0 13	21 24 42.78	6 49 59.4	32.3	31.4	2.11	25	21 21	21 33 25.65	10 52 48.8	18.0	17.5	1.19
9	0 6	21 22 13.72	6 54 52.1	32.3	31.4	2.11	26	21 20	21 36 18.66	10 48 4.3	17.7	17.2	1.17
10	0 0	21 19 45.64	7 0 30.8	32.3	31.4	2.11	27	21 19	21 39 15.42	-10 42 45.9	17.5	17.0	1.15
10	23 54	21 17 19.47	7 6 52.3	32.2	31.3	2.11	28	21 18	21 42 15.75	10 36 53.9	17.2	16.7	1.13
11	23 47	21 14 56.12	7 13 53.3	32.1	31.2	2.10	29	21 17	21 45 19.48	10 30 28.4	16.9	16.5	1.12
12	23 41	21 12 36.48	7 21 30.0	32.0	31.1	2.09	30	21 16	21 48 26.43	10 23 29.7	16.7	16.2	1.10
13	23 35	21 10 21.42	7 29 38.6	31.8	30.9	2.08	31	21 15	21 51 36.46	10 15 58.2	16.5	16.0	1.08
14	23 29	21 8 11.75	7 38 15.1	31.6	30.7	2.07	Apr. 1	21 14	21 54 49.40	-10 7 54.1	16.2	15.8	1.07
15	23 23	21 6 8.21	7 47 15.6	31.4	30.5	2.05	2	21 14	21 58 5.12	9 59 17.9	16.0	15.5	1.05

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m s	h m s	" " "	"	" "	s		h m s	h m s	" " "	"	" "	s
Apr. 1	21 14	21 54 49.40	-10 7 54.1	16.2	15.8	1.07	May 17	21 7	0 49 11.26	+ 3 20 10.2	9.7	9.5	0.63
2	21 14	21 58 5.12	9 59 17.9	16.0	15.5	1.05	18	21 8	0 53 17.59	3 43 24.9	9.7	9.4	0.63
3	21 13	22 1 23.45	9 50 9.9	15.8	15.3	1.04	19	21 8	0 57 24.58	4 6 43.5	9.6	9.3	0.62
4	21 12	22 4 44.28	9 40 30.5	15.6	15.1	1.02	20	21 8	1 1 32.25	4 30 5.2	9.5	9.2	0.62
5	21 12	22 8 7.47	9 30 20.3	15.4	14.9	1.01	21	21 8	1 5 40.61	4 53 29.6	9.4	9.1	0.61
6	21 11	22 11 32.87	9 19 39.5	15.2	14.7	0.99	22	21 8	1 9 49.68	+ 5 16 56.0	9.3	9.1	0.61
7	21 11	22 15 0.38	9 8 29.0	15.0	14.5	0.98	23	21 9	1 13 59.48	5 40 23.6	9.3	9.0	0.60
8	21 10	22 18 29.88	8 56 49.0	14.8	14.3	0.97	24	21 9	1 18 10.02	6 3 51.8	9.2	8.9	0.60
9	21 10	22 22 1.24	8 44 40.0	14.6	14.2	0.95	25	21 9	1 22 21.32	6 27 19.8	9.1	8.9	0.59
10	21 10	22 25 34.38	8 32 2.7	14.4	14.0	0.94	26	21 9	1 26 33.42	6 50 46.9	9.0	8.8	0.59
11	21 9	22 29 9.18	8 18 57.6	14.2	13.8	0.93	27	21 10	1 30 46.33	+ 7 14 12.5	9.0	8.7	0.59
12	21 9	22 32 45.56	8 5 25.1	14.0	13.6	0.92	28	21 10	1 35 0.06	7 37 35.9	8.9	8.6	0.58
13	21 9	22 36 23.43	7 51 25.9	13.9	13.5	0.90	29	21 10	1 39 14.64	8 0 56.4	8.8	8.6	0.58
14	21 8	22 40 2.71	7 37 0.3	13.7	13.3	0.89	30	21 10	1 43 30.06	8 24 13.3	8.8	8.5	0.57
15	21 8	22 43 43.33	7 22 9.2	13.5	13.1	0.88	31	21 11	1 47 46.36	8 47 25.9	8.7	8.4	0.57
16	21 8	22 47 25.23	7 6 52.7	13.4	13.0	0.87	June 1	21 11	1 52 3.56	+ 9 10 33.4	8.6	8.4	0.57
17	21 8	22 51 8.35	6 51 11.6	13.2	12.8	0.86	2	21 11	1 56 21.66	9 33 35.2	8.6	8.3	0.56
18	21 7	22 54 52.62	6 35 6.3	13.0	12.7	0.85	3	21 12	2 0 40.69	9 56 30.3	8.5	8.3	0.56
19	21 7	22 58 38.00	6 18 37.6	12.9	12.5	0.84	4	21 12	2 5 0.65	10 19 18.4	8.4	8.2	0.56
20	21 7	23 2 24.44	6 1 45.6	12.7	12.4	0.83	5	21 13	2 9 21.56	10 41 58.4	8.4	8.2	0.55
21	21 7	23 6 11.89	5 44 31.3	12.6	12.3	0.82	6	21 13	2 13 43.44	+11 4 29.7	8.3	8.1	0.55
22	21 7	23 10 0.29	5 26 55.1	12.5	12.1	0.81	7	21 13	2 18 6.30	11 26 51.7	8.3	8.0	0.55
23	21 7	23 13 49.63	5 8 57.7	12.3	12.0	0.80	8	21 14	2 22 30.14	11 49 3.5	8.2	8.0	0.54
24	21 7	23 17 39.87	4 50 39.5	12.2	11.8	0.79	9	21 14	2 26 54.99	12 11 4.4	8.2	7.9	0.54
25	21 6	23 21 30.95	4 32 1.4	12.0	11.7	0.78	10	21 15	2 31 20.85	12 32 53.9	8.1	7.9	0.54
26	21 6	23 25 22.87	4 13 3.9	11.9	11.6	0.77	11	21 15	2 35 47.77	+12 54 31.1	8.0	7.8	0.53
27	21 6	23 29 15.60	3 53 47.5	11.8	11.5	0.77	12	21 16	2 40 15.72	13 15 55.4	8.0	7.8	0.53
28	21 6	23 33 9.09	3 34 13.0	11.7	11.3	0.76	13	21 16	2 44 44.74	13 37 6.0	7.9	7.7	0.53
29	21 6	23 37 3.35	3 14 20.9	11.5	11.2	0.75	14	21 17	2 49 14.85	13 58 2.3	7.9	7.7	0.53
30	21 6	23 40 58.32	2 54 11.9	11.4	11.1	0.74	15	21 18	2 53 46.05	14 18 43.5	7.8	7.6	0.52
May 1	21 6	23 44 54.01	2 33 46.9	11.3	11.0	0.73	16	21 18	2 58 18.36	+14 39 9.2	7.8	7.6	0.52
2	21 6	23 48 50.40	2 13 6.2	11.2	10.9	0.73	17	21 19	3 2 51.79	14 59 18.2	7.7	7.5	0.52
3	21 6	23 52 47.45	1 52 10.8	11.1	10.8	0.72	18	21 19	3 7 26.34	15 19 10.2	7.7	7.5	0.52
4	21 6	23 56 45.16	1 31 1.3	11.0	10.7	0.71	19	21 20	3 12 2.05	15 38 44.3	7.7	7.4	0.51
5	21 6	0 0 43.52	1 9 38.3	10.9	10.6	0.70	20	21 21	3 15 38.91	15 58 0.0	7.6	7.4	0.51
6	21 6	0 4 42.50	0 48 2.6	10.8	10.5	0.70	21	21 21	3 21 16.95	+16 16 56.3	7.6	7.4	0.51
7	21 6	0 8 42.09	0 26 15.0	10.7	10.4	0.69	22	21 22	3 25 56.15	16 35 32.9	7.5	7.3	0.51
8	21 6	0 12 42.31	0 4 16.0	10.6	10.3	0.68	23	21 23	3 30 36.55	16 53 48.8	7.5	7.3	0.51
9	21 6	0 16 43.12	+ 0 17 53.5	10.5	10.2	0.68	24	21 24	3 35 18.14	17 11 43.4	7.4	7.2	0.50
10	21 7	0 20 44.53	0 40 12.9	10.4	10.1	0.67	25	21 24	3 40 0.93	17 29 16.0	7.4	7.2	0.50
11	21 7	0 24 46.54	+ 1 2 41.5	10.3	10.0	0.66	26	21 25	3 44 44.91	+17 46 25.9	7.3	7.1	0.50
12	21 7	0 28 49.13	1 25 18.8	10.2	9.9	0.66	27	21 26	3 49 30.09	18 3 12.6	7.3	7.1	0.50
13	21 7	0 32 52.33	1 48 4.0	10.1	9.8	0.65	28	21 27	3 54 16.46	18 19 35.2	7.3	7.1	0.50
14	21 7	0 36 56.12	2 10 56.4	10.0	9.7	0.65	29	21 28	3 59 4.02	18 35 32.9	7.2	7.0	0.49
15	21 7	0 41 0.54	2 33 55.3	9.9	9.6	0.64	30	21 29	4 3 52.75	18 51 5.3	7.2	7.0	0.49
16	21 7	0 45 5.58	+ 2 57 0.2	9.8	9.5	0.64	July 1	21 29	4 8 42.66	+19 6 11.7	7.1	6.9	0.49
17	21 7	0 49 11.26	+ 3 20 10.2	9.7	9.5	0.63	2	21 30	4 13 33.72	+19 20 51.3	7.1	6.9	0.49

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.
	h m	h m s	" " "	"	" s		h m	h m s	" " "	"	" s
July	1 21 29	4 8 42.66	+19 6 11.7	7.1	6.9 0.49	Aug. 16	22 23	8 3 29.13	+20 35 44.7	5.9	5.7 0.41
	2 21 30	4 13 33.72	19 20 51.3	7.1	6.9 0.49		17 22 24	8 8 35.89	20 23 14.6	5.9	5.7 0.41
	3 21 31	4 18 25.94	19 35 3.5	7.1	6.9 0.49		18 22 25	8 13 41.98	20 10 9.2	5.9	5.7 0.40
	4 21 32	4 23 19.29	19 48 47.5	7.0	6.8 0.48		19 22 26	8 18 47.38	19 56 29.1	5.8	5.7 0.40
	5 21 33	4 28 13.73	20 2 3.2	7.0	6.8 0.48		20 22 27	8 23 52.05	19 42 14.2	5.8	5.7 0.40
	6 21 34	4 33 9.26	+20 14 49.6	7.0	6.8 0.48		21 22 28	8 28 55.99	+19 27 25.5	5.8	5.6 0.40
	7 21 35	4 38 5.85	20 27 6.1	6.9	6.7 0.48		22 22 30	8 33 59.17	19 12 3.0	5.8	5.6 0.40
	8 21 36	4 43 3.48	20 38 52.2	6.9	6.7 0.48		23 22 31	8 39 1.57	18 56 7.6	5.8	5.6 0.40
	9 21 37	4 48 2.12	20 50 7.3	6.9	6.7 0.48		24 22 32	8 44 3.17	18 39 39.4	5.8	5.6 0.39
	10 21 38	4 53 1.75	21 0 51.0	6.8	6.6 0.47		25 22 33	8 49 3.96	18 22 39.0	5.7	5.6 0.39
	11 21 39	4 58 2.33	+21 11 2.5	6.8	6.6 0.47		26 22 34	8 54 3.92	+18 5 7.0	5.7	5.6 0.39
	12 21 40	5 3 3.84	21 20 41.7	6.8	6.6 0.47		27 22 35	8 59 3.04	17 47 3.8	5.7	5.6 0.39
	13 21 41	5 8 6.25	21 29 47.7	6.7	6.5 0.47		28 22 36	9 4 1.30	17 28 30.2	5.7	5.5 0.39
	14 21 43	5 13 9.52	21 38 20.2	6.7	6.5 0.47		29 22 37	9 8 58.70	17 9 26.6	5.7	5.5 0.39
	15 21 44	5 18 13.63	21 46 18.7	6.7	6.5 0.46		30 22 38	9 13 55.23	16 49 53.7	5.7	5.5 0.38
	16 21 45	5 23 18.55	+21 53 42.8	6.6	6.4 0.46		31 22 39	9 18 50.87	+16 29 52.0	5.6	5.5 0.38
	17 21 46	5 28 24.22	22 0 32.0	6.6	6.4 0.46	Sept. 1	22 40	9 23 45.63	16 9 22.2	5.6	5.5 0.38
	18 21 47	5 33 30.63	22 6 45.8	6.6	6.4 0.46		2 22 41	9 28 39.50	15 48 24.8	5.6	5.5 0.38
	19 21 48	5 38 37.71	22 12 24.0	6.5	6.4 0.46		3 22 42	9 33 32.48	15 27 0.5	5.6	5.5 0.38
	20 21 50	5 43 45.45	22 17 26.3	6.5	6.3 0.46		4 22 43	9 38 24.57	15 5 10.1	5.6	5.4 0.38
	21 21 51	5 48 53.80	+22 21 52.1	6.5	6.3 0.45		5 22 44	9 43 15.79	+14 42 54.1	5.6	5.4 0.37
	22 21 52	5 54 2.73	22 25 41.2	6.5	6.3 0.45		6 22 44	9 48 6.11	14 20 13.0	5.6	5.4 0.37
	23 21 53	5 59 12.16	22 28 53.3	6.4	6.2 0.45		7 22 45	9 52 55.57	13 57 7.8	5.6	5.4 0.37
	24 21 54	6 4 22.08	22 31 28.2	6.4	6.2 0.45		8 22 46	9 57 44.16	13 33 39.0	5.5	5.4 0.37
	25 21 56	6 9 32.45	22 33 25.6	6.4	6.2 0.45		9 22 47	10 2 31.90	13 9 47.2	5.5	5.4 0.37
	26 21 57	6 14 43.20	+22 34 45.2	6.4	6.2 0.45		10 22 48	10 7 18.80	+12 45 33.3	5.5	5.4 0.37
	27 21 58	6 19 54.28	22 35 26.8	6.3	6.2 0.44		11 22 49	10 12 4.87	12 20 57.8	5.5	5.4 0.37
	28 21 59	6 25 5.67	22 35 30.4	6.3	6.1 0.44		12 22 50	10 16 50.16	11 56 1.3	5.5	5.3 0.36
	29 22 1	6 30 17.30	22 34 55.6	6.3	6.1 0.44		13 22 50	10 21 34.66	11 30 44.5	5.5	5.3 0.36
	30 22 2	6 35 29.11	22 33 42.6	6.3	6.1 0.44		14 22 51	10 26 18.37	11 5 8.4	5.5	5.3 0.36
	31 22 3	6 40 41.07	+22 31 51.1	6.2	6.1 0.44		15 22 52	10 31 1.36	+10 39 13.5	5.5	5.3 0.36
Aug.	1 22 4	6 45 53.10	22 29 21.1	6.2	6.0 0.44		16 22 53	10 35 43.63	10 13 0.3	5.5	5.3 0.36
	2 22 6	6 51 5.16	22 26 12.6	6.2	6.0 0.43		17 22 53	10 40 25.20	9 46 29.6	5.4	5.3 0.36
	3 22 7	6 56 17.19	22 22 25.7	6.2	6.0 0.43		18 22 54	10 45 6.10	9 19 42.2	5.4	5.3 0.36
	4 22 8	7 1 29.15	22 18 0.1	6.1	6.0 0.43		19 22 55	10 49 46.38	8 52 38.7	5.4	5.3 0.36
	5 22 9	7 6 40.98	+22 12 56.3	6.1	6.0 0.43		20 22 56	10 54 26.05	+ 8 25 19.8	5.4	5.3 0.35
	6 22 11	7 11 52.64	22 7 14.1	6.1	5.9 0.43		21 22 56	10 59 5.15	7 57 46.2	5.4	5.2 0.35
	7 22 12	7 17 4.04	22 0 53.8	6.1	5.9 0.42		22 22 57	11 3 43.71	7 29 58.7	5.4	5.2 0.35
	8 22 13	7 22 15.19	21 53 55.3	6.1	5.9 0.42		23 22 58	11 8 21.77	7 1 57.8	5.4	5.2 0.35
	9 22 14	7 27 26.03	21 46 19.1	6.0	5.9 0.42		24 22 58	11 12 59.35	6 33 44.4	5.4	5.2 0.35
	10 22 15	7 32 36.49	+21 38 5.2	6.0	5.8 0.42		25 22 59	11 17 36.49	+ 6 5 19.1	5.4	5.2 0.35
	11 22 17	7 37 46.52	21 29 13.8	6.0	5.8 0.42		26 23 0	11 22 13.22	5 36 42.6	5.4	5.2 0.35
	12 22 18	7 42 56.11	21 19 45.3	6.0	5.8 0.42		27 23 0	11 26 49.58	5 7 55.8	5.3	5.2 0.35
	13 22 19	7 48 5.20	21 9 39.8	5.9	5.8 0.41		28 23 1	11 31 25.60	4 38 59.3	5.3	5.2 0.35
	14 22 20	7 53 13.77	20 58 57.7	5.9	5.8 0.41		29 23 2	11 36 1.32	4 9 53.9	5.3	5.2 0.35
	15 22 22	7 58 21.75	+20 47 39.2	5.9	5.8 0.41		30 23 2	11 40 36.76	+ 3 40 40.2	5.3	5.2 0.35
16	22 23	8 3 29.13	+20 35 44.7	5.9	5.7 0.41	Oct. 1	23 3	11 45 11.98	+ 3 11 19.1	5.3	5.2 0.35

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Gen. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Gen. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	23 31	11 45 11.98	+ 3 11 19.1	5.3	5.2	0.35	Nov. 14	23 37	15 12 48.91	-17 12 46.4	5.1	5.0	0.35
2	23 41	11 49 46.99	2 41 51.3	5.3	5.2	0.34	15	23 38	15 17 51.72	17 34 35.4	5.1	5.0	0.35
3	23 41	11 54 21.84	2 12 17.5	5.3	5.2	0.34	16	23 39	15 22 55.76	17 55 56.2	5.1	5.0	0.35
4	23 51	11 58 56.56	1 42 38.6	5.3	5.2	0.34	17	23 40	15 28 1.02	18 16 48.0	5.1	5.0	0.35
5	23 51	12 3 31.20	1 12 55.1	5.3	5.1	0.34	18	23 42	15 33 7.53	18 37 10.1	5.1	5.0	0.35
6	23 61	12 8 5.78	+ 0 43 7.9	5.3	5.1	0.34	19	23 43	15 38 15.27	-18 57 1.7	5.1	5.0	0.35
7	23 71	12 12 40.35	+ 0 13 17.8	5.3	5.1	0.34	20	23 44	15 43 24.24	19 16 21.9	5.1	5.0	0.35
8	23 71	12 17 14.94	- 0 16 34.7	5.3	5.1	0.34	21	23 45	15 48 34.44	19 35 10.1	5.1	5.0	0.35
9	23 81	12 21 49.60	0 46 28.6	5.3	5.1	0.34	22	23 46	15 53 45.86	19 53 25.5	5.1	5.0	0.35
10	23 91	12 26 24.37	1 16 23.2	5.3	5.1	0.34	23	23 48	15 58 58.49	20 11 7.5	5.1	5.0	0.36
11	23 91	12 30 59.27	- 1 46 18.0	5.2	5.1	0.34	24	23 49	16 4 12.32	-20 28 15.2	5.1	5.0	0.36
12	23 101	12 35 34.37	2 16 12.1	5.2	5.1	0.34	25	23 50	16 9 27.31	20 44 47.9	5.1	5.0	0.36
13	23 111	12 40 9.68	2 46 4.6	5.2	5.1	0.34	26	23 52	16 14 43.47	21 0 45.0	5.1	5.0	0.36
14	23 111	12 44 45.27	3 15 55.0	5.2	5.1	0.34	27	23 53	16 20 0.75	21 16 5.7	5.1	5.0	0.36
15	23 121	12 49 21.15	3 45 42.4	5.2	5.1	0.34	28	23 54	16 25 19.14	21 30 49.5	5.1	5.0	0.36
16	23 131	12 53 57.38	- 4 15 26.1	5.2	5.1	0.34	29	23 56	16 30 38.60	-21 44 55.7	5.1	5.0	0.36
17	23 131	12 58 34.00	4 45 5.4	5.2	5.1	0.34	30	23 57	16 35 59.11	21 58 23.7	5.1	5.0	0.36
18	23 141	13 3 11.07	5 14 39.5	5.2	5.1	0.34	Dec. 1	23 58	16 41 20.61	22 11 12.7	5.1	5.0	0.36
19	23 151	13 7 48.61	5 44 7.6	5.2	5.1	0.34	3	0 0	16 46 43.09	22 23 22.4	5.2	5.0	0.36
20	23 151	13 12 26.66	6 13 29.1	5.2	5.1	0.34	4	0 1	16 52 6.49	22 34 52.1	5.2	5.0	0.36
21	23 161	13 17 5.26	- 6 42 43.0	5.2	5.0	0.34	5	0 3	16 57 30.77	-22 45 41.2	5.2	5.0	0.36
22	23 171	13 21 44.48	7 11 48.9	5.2	5.0	0.34	6	0 4	17 2 55.88	22 55 49.3	5.2	5.0	0.36
23	23 171	13 26 24.33	7 40 45.8	5.2	5.0	0.34	7	0 6	17 8 21.78	23 5 16.0	5.2	5.0	0.36
24	23 181	13 31 4.86	8 9 32.9	5.2	5.0	0.34	8	0 7	17 13 48.40	23 14 0.7	5.2	5.0	0.36
25	23 191	13 35 46.12	8 38 9.4	5.2	5.0	0.34	9	0 9	17 19 15.71	23 22 3.0	5.2	5.0	0.36
26	23 201	13 40 28.12	- 9 6 34.5	5.2	5.0	0.34	10	0 10	17 24 43.63	-23 29 22.6	5.2	5.0	0.36
27	23 201	13 45 10.91	9 34 47.6	5.2	5.0	0.34	11	0 12	17 30 12.11	23 35 59.1	5.2	5.0	0.36
28	23 211	13 49 54.52	10 2 47.8	5.2	5.0	0.34	12	0 13	17 35 41.10	23 41 52.2	5.2	5.0	0.37
29	23 221	13 54 38.99	10 30 34.1	5.2	5.0	0.34	13	0 15	17 41 10.54	23 47 1.5	5.2	5.0	0.37
30	23 231	13 59 24.35	10 58 5.8	5.2	5.0	0.34	14	0 16	17 46 40.37	23 51 26.9	5.2	5.0	0.37
31	23 241	14 4 10.63	-11 25 22.3	5.2	5.0	0.34	15	0 18	17 52 10.52	-23 55 8.2	5.2	5.0	0.37
Nov. 1	23 241	14 8 57.85	11 52 22.6	5.2	5.0	0.34	16	0 20	17 57 40.94	23 58 4.9	5.2	5.0	0.37
2	23 251	14 13 46.05	12 19 5.9	5.2	5.0	0.34	17	0 21	18 3 11.57	24 0 17.1	5.2	5.0	0.37
3	23 261	14 18 35.25	12 45 31.4	5.2	5.0	0.34	18	0 23	18 8 42.34	24 1 44.7	5.2	5.0	0.37
4	23 271	14 23 25.48	13 11 38.3	5.2	5.0	0.34	19	0 24	18 14 13.18	24 2 27.3	5.2	5.0	0.37
5	23 281	14 28 16.75	-13 37 25.8	5.2	5.0	0.34	20	0 26	18 19 44.05	-24 2 25.1	5.2	5.0	0.37
6	23 291	14 33 9.11	14 2 53.1	5.1	5.0	0.34	21	0 27	18 25 14.87	24 1 38.0	5.2	5.0	0.37
7	23 301	14 38 2.56	14 27 59.3	5.1	5.0	0.34	22	0 29	18 30 45.56	24 0 5.9	5.2	5.0	0.37
8	23 311	14 42 57.12	14 52 43.7	5.1	5.0	0.35	23	0 30	18 36 16.10	23 57 49.1	5.2	5.0	0.37
9	23 321	14 47 52.83	15 17 5.5	5.1	5.0	0.35	24	0 32	18 41 46.38	23 54 47.6	5.2	5.1	0.37
10	23 331	14 52 49.68	-15 41 3.7	5.1	5.0	0.35	25	0 34	18 47 16.37	-23 51 1.3	5.2	5.1	0.37
11	23 341	14 57 47.70	16 4 37.8	5.1	5.0	0.35	26	0 35	18 52 45.99	23 46 30.7	5.2	5.1	0.37
12	23 351	15 2 46.90	16 27 46.8	5.1	5.0	0.35	27	0 37	18 58 15.17	23 41 15.7	5.2	5.1	0.37
13	23 361	15 7 47.30	16 50 29.9	5.1	5.0	0.35	28	0 38	19 3 43.85	23 35 16.6	5.2	5.1	0.37
14	23 371	15 12 48.91	17 12 46.4	5.1	5.0	0.35	29	0 40	19 9 11.98	23 28 33.7	5.2	5.1	0.37
15	23 381	15 17 51.72	-17 34 35.4	5.1	5.0	0.35	30	0 41	19 14 39.50	-23 21 7.3	5.2	5.1	0.37
16	23 391	15 22 55.76	-17 55 56.2	5.1	5.0	0.35	31	0 43	19 20 6.34	-23 12 57.8	5.2	5.1	0.37

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sun. P. M. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sun. P. M. Mer.
	h m	h m s	° ' "	"	" s		h m	h m s	° ' "	"	" s
Jan. 0	17 13	11 54 1.17	+3 35 35.2	7.7	4.4 0.30	Feb. 15	14 32	12 13 35.55	+2 36 17.2	11.6	6.7 0.44
1	17 10	11 55 12.33	3 29 18.5	7.8	4.5 0.30	16	14 27	12 13 0.57	2 41 10.2	11.7	6.7 0.45
2	17 8	11 56 22.01	3 23 12.1	7.9	4.5 0.30	17	14 23	12 12 22.70	2 46 18.9	11.8	6.8 0.45
3	17 5	11 57 30.17	3 17 15.8	7.9	4.6 0.30	18	14 18	12 11 41.98	2 51 43.1	11.9	6.8 0.46
4	17 2	11 58 36.79	3 11 30.1	8.0	4.6 0.31	19	14 13	12 10 58.42	2 57 22.2	12.0	6.9 0.46
5	16 59	11 59 41.82	+3 5 55.4	8.1	4.6 0.31	20	14 9	12 10 12.06	+3 3 16.1	12.1	6.9 0.46
6	16 56	12 0 45.22	3 0 31.8	8.1	4.7 0.31	21	14 4	12 9 22.93	3 9 24.3	12.2	7.0 0.47
7	16 53	12 1 46.98	2 55 19.4	8.2	4.7 0.32	22	13 59	12 8 31.06	3 15 46.3	12.2	7.0 0.47
8	16 50	12 2 47.03	2 50 18.6	8.3	4.8 0.32	23	13 54	12 7 36.52	3 22 21.8	12.3	7.1 0.47
9	16 47	12 3 45.35	2 45 29.6	8.4	4.8 0.32	24	13 49	12 6 39.34	3 29 10.2	12.4	7.1 0.47
10	16 44	12 4 41.89	+2 40 52.7	8.4	4.8 0.32	25	13 44	12 5 39.58	+3 36 10.9	12.5	7.2 0.48
11	16 41	12 5 36.62	2 36 28.2	8.5	4.9 0.33	26	13 39	12 4 37.32	3 43 23.2	12.5	7.2 0.48
12	16 38	12 6 29.49	2 32 16.1	8.6	4.9 0.33	27	13 34	12 3 32.62	3 50 46.7	12.6	7.2 0.48
13	16 35	12 7 20.47	2 28 16.7	8.7	5.0 0.33	28	13 29	12 2 25.56	3 58 20.6	12.7	7.3 0.49
14	16 32	12 8 9.53	2 24 30.3	8.7	5.0 0.33	Mar. 1	13 24	12 1 16.22	4 6 4.2	12.7	7.3 0.49
15	16 29	12 8 56.62	+2 20 57.1	8.8	5.1 0.34	2	13 19	12 0 4.69	+4 13 56.7	12.8	7.4 0.49
16	16 26	12 9 41.71	2 17 37.1	8.9	5.1 0.34	3	13 14	11 58 51.07	4 21 57.3	12.9	7.4 0.49
17	16 22	12 10 24.78	2 14 30.6	9.0	5.2 0.34	4	13 9	11 57 35.47	4 30 5.1	12.9	7.4 0.50
18	16 19	12 11 5.77	2 11 37.9	9.1	5.2 0.35	5	13 4	11 56 18.00	4 38 19.3	13.0	7.4 0.50
19	16 16	12 11 44.65	2 8 59.0	9.1	5.2 0.35	6	12 58	11 54 58.79	4 46 38.8	13.0	7.5 0.50
20	16 13	12 12 21.39	+2 6 34.1	9.2	5.3 0.35	7	12 53	11 53 37.96	+4 55 2.7	13.1	7.5 0.50
21	16 9	12 12 55.96	2 4 23.5	9.3	5.3 0.36	8	12 48	11 52 15.64	5 3 30.0	13.1	7.5 0.50
22	16 6	12 13 28.30	2 2 27.4	9.4	5.4 0.36	9	12 42	11 50 51.99	5 11 59.7	13.2	7.5 0.51
23	16 2	12 13 58.39	2 0 46.0	9.5	5.4 0.36	10	12 37	11 49 27.15	5 20 30.6	13.2	7.6 0.51
24	15 59	12 14 26.17	1 59 19.6	9.6	5.5 0.37	11	12 32	11 48 1.27	5 29 1.6	13.2	7.6 0.51
25	15 55	12 14 51.62	+1 58 8.3	9.7	5.5 0.37	12	12 26	11 46 34.53	+5 37 31.6	13.2	7.6 0.51
26	15 52	12 15 14.69	1 57 12.4	9.7	5.6 0.37	13	12 21	11 45 7.09	5 45 59.6	13.3	7.6 0.51
27	15 48	12 15 35.33	1 56 32.1	9.8	5.6 0.38	14	12 16	11 43 39.12	5 54 24.3	13.3	7.6 0.51
28	15 45	12 15 53.50	1 56 7.5	9.9	5.7 0.38	15	12 10	11 42 10.81	6 2 44.7	13.3	7.6 0.51
29	15 41	12 16 9.16	1 55 58.9	10.0	5.8 0.38	16	12 5	11 40 42.32	6 10 59.8	13.3	7.6 0.51
30	15 37	12 16 22.26	+1 56 6.5	10.1	5.8 0.39	17	11 59	11 39 13.81	+6 19 8.3	13.3	7.6 0.51
31	15 34	12 16 32.77	1 56 30.3	10.2	5.9 0.39	18	11 54	11 37 45.47	6 27 9.3	13.3	7.6 0.51
Feb. 1	15 30	12 16 40.63	1 57 10.6	10.3	5.9 0.39	19	11 49	11 36 17.45	6 35 2.0	13.3	7.6 0.51
2	15 26	12 16 45.82	1 58 7.7	10.4	6.0 0.40	20	11 43	11 34 49.92	6 42 45.5	13.3	7.6 0.51
3	15 22	12 16 48.30	1 59 21.7	10.5	6.0 0.40	21	11 38	11 33 23.04	6 50 18.7	13.3	7.6 0.51
4	15 18	12 16 48.02	+2 0 52.5	10.6	6.1 0.40	22	11 32	11 31 56.97	+6 57 41.0	13.3	7.6 0.51
5	15 14	12 16 44.94	2 2 40.4	10.7	6.1 0.41	23	11 27	11 30 31.85	7 4 51.5	13.2	7.6 0.51
6	15 10	12 16 39.04	2 4 45.4	10.8	6.2 0.41	24	11 22	11 29 7.84	7 11 49.4	13.2	7.6 0.51
7	15 6	12 16 30.30	2 7 7.6	10.9	6.2 0.42	25	11 17	11 27 45.07	7 18 34.1	13.2	7.6 0.51
8	15 2	12 16 18.67	2 9 47.1	10.9	6.3 0.42	26	11 11	11 26 23.69	7 25 4.7	13.1	7.5 0.51
9	14 58	12 16 4.13	+2 12 43.6	11.0	6.3 0.42	27	11 6	11 25 3.84	+7 31 20.9	13.1	7.5 0.51
10	14 53	12 15 46.69	2 15 57.3	11.1	6.4 0.43	28	11 1	11 23 45.62	7 37 21.9	13.1	7.5 0.50
11	14 49	12 15 26.32	2 19 27.9	11.2	6.5 0.43	29	10 56	11 22 29.17	7 43 7.3	13.0	7.5 0.50
12	14 45	12 15 3.01	2 23 15.4	11.3	6.5 0.43	30	10 50	11 21 14.60	7 48 36.5	13.0	7.4 0.50
13	14 41	12 14 36.78	2 27 19.6	11.4	6.6 0.44	31	10 45	11 20 2.03	7 53 49.1	12.9	7.4 0.50
14	14 36	12 14 7.62	+2 31 40.3	11.5	6.6 0.44	Apr. 1	10 40	11 18 51.55	+7 58 44.7	12.9	7.4 0.50
15	14 32	12 13 35.55	+2 36 17.2	11.6	6.7 0.44	2	10 35	11 17 43.27	+8 3 23.0	12.8	7.4 0.49

Stellar magnitude at opposition in March, 1918, -1.1.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. "	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. "	S. T. of Sem. Pass. Mer.
	h m	h m s	" ' "	"	"	s		h m	h m s	" ' "	"	"	s
pr. 1	10 40	11 18 51.55	+7 58 44.7	12.9	7.4	0.50	May 17	7 33	11 13 2.56	+6 32 55.3	9.3	5.3	0.36
2	10 35	11 17 43.27	8 3 23.0	12.8	7.4	0.49	18	7 30	11 13 52.90	6 25 23.8	9.2	5.3	0.35
3	10 30	11 16 37.29	8 7 43.5	12.7	7.3	0.49	19	7 27	11 14 45.12	6 17 41.5	9.1	5.2	0.35
4	10 25	11 15 33.69	8 11 46.1	12.7	7.3	0.49	20	7 24	11 15 39.19	6 9 48.8	9.1	5.2	0.35
5	10 20	11 14 32.54	8 15 30.4	12.6	7.2	0.49	21	7 21	11 16 35.07	6 1 45.7	9.0	5.2	0.35
6	10 15	11 13 33.93	+8 18 56.3	12.6	7.2	0.49	22	7 18	11 17 32.73	+5 53 32.6	8.9	5.1	0.34
7	10 10	11 12 37.93	8 22 3.6	12.5	7.2	0.48	23	7 15	11 18 32.12	5 45 9.5	8.9	5.1	0.34
8	10 5	11 11 44.61	8 24 52.0	12.4	7.1	0.48	24	7 12	11 19 33.19	5 36 36.6	8.8	5.0	0.34
9	10 1	11 10 54.04	8 27 21.4	12.3	7.1	0.48	25	7 10	11 20 35.92	5 27 54.3	8.7	5.0	0.33
10	9 56	11 10 6.26	8 29 31.8	12.3	7.0	0.47	26	7 7	11 21 40.27	5 19 2.7	8.7	5.0	0.33
11	9 51	11 9 21.30	+8 31 23.3	12.2	7.0	0.47	27	7 4	11 22 46.20	+5 10 1.9	8.6	4.9	0.33
12	9 47	11 8 39.23	8 32 55.7	12.1	6.9	0.47	28	7 1	11 23 53.67	5 0 52.1	8.5	4.9	0.33
13	9 42	11 8 0.06	8 34 9.0	12.0	6.9	0.47	29	6 58	11 25 2.67	4 51 33.5	8.5	4.9	0.33
14	9 38	11 7 23.83	8 35 3.5	11.9	6.8	0.46	30	6 56	11 26 13.16	4 42 6.1	8.4	4.8	0.32
15	9 33	11 6 50.53	8 35 39.3	11.9	6.8	0.46	31	6 53	11 27 25.11	4 32 30.2	8.3	4.8	0.32
16	9 29	11 6 20.18	+8 35 56.4	11.8	6.8	0.46	June 1	6 50	11 28 38.50	+4 22 45.9	8.3	4.8	0.32
17	9 24	11 5 52.79	8 35 55.2	11.7	6.7	0.45	2	6 47	11 29 53.31	4 12 53.4	8.2	4.7	0.32
18	9 20	11 5 28.34	8 35 35.8	11.6	6.7	0.45	3	6 45	11 31 9.51	4 2 52.6	8.2	4.7	0.31
19	9 16	11 5 6.83	8 34 58.5	11.5	6.6	0.45	4	6 42	11 32 27.07	3 52 43.8	8.1	4.7	0.31
20	9 11	11 4 48.23	8 34 3.4	11.5	6.6	0.44	5	6 39	11 33 45.96	3 42 27.0	8.1	4.6	0.31
21	9 7	11 4 32.54	+8 32 50.9	11.4	6.5	0.44	6	6 37	11 35 6.18	+3 32 2.6	8.0	4.6	0.31
22	9 3	11 4 19.73	8 31 21.3	11.3	6.5	0.44	7	6 34	11 36 27.70	3 21 30.4	7.9	4.6	0.30
23	8 59	11 4 9.79	8 29 34.6	11.2	6.4	0.43	8	6 32	11 37 50.49	3 10 50.7	7.9	4.5	0.30
24	8 55	11 4 2.68	8 27 31.3	11.1	6.4	0.43	9	6 29	11 39 14.55	3 0 3.7	7.8	4.5	0.30
25	8 51	11 3 58.37	8 25 11.7	11.0	6.3	0.43	10	6 27	11 40 39.82	2 49 9.4	7.8	4.5	0.30
26	8 47	11 3 56.84	+8 22 35.9	10.9	6.3	0.42	11	6 24	11 42 6.29	+2 38 8.1	7.7	4.4	0.30
27	8 43	11 3 58.05	8 19 44.1	10.9	6.2	0.42	12	6 22	11 43 33.95	2 27 0.0	7.7	4.4	0.29
28	8 39	11 4 1.95	8 16 36.7	10.8	6.2	0.42	13	6 19	11 45 2.77	2 15 45.2	7.6	4.4	0.29
29	8 35	11 4 8.51	8 13 13.9	10.7	6.1	0.41	14	6 17	11 46 32.71	2 4 23.8	7.6	4.4	0.29
30	8 32	11 4 17.71	8 9 36.0	10.6	6.1	0.41	15	6 14	11 48 3.77	1 52 55.9	7.5	4.3	0.29
lay 1	8 28	11 4 29.51	+8 5 43.0	10.5	6.0	0.41	16	6 12	11 49 35.91	+1 41 21.8	7.5	4.3	0.29
2	8 24	11 4 43.88	8 1 35.5	10.4	6.0	0.40	17	6 10	11 51 9.11	1 29 41.6	7.4	4.3	0.28
3	8 21	11 5 0.78	7 57 13.6	10.3	5.9	0.40	18	6 7	11 52 43.36	1 17 55.4	7.4	4.3	0.28
4	8 17	11 5 20.17	7 52 37.6	10.3	5.9	0.40	19	6 5	11 54 18.64	1 6 3.4	7.4	4.2	0.28
5	8 13	11 5 42.02	7 47 47.5	10.2	5.8	0.39	20	6 3	11 55 54.93	0 54 5.8	7.3	4.2	0.28
6	8 10	11 6 6.30	+7 42 43.7	10.1	5.8	0.39	21	6 0	11 57 32.20	+0 42 2.6	7.3	4.2	0.28
7	8 6	11 6 32.96	7 37 26.3	10.0	5.7	0.39	22	5 58	11 59 10.44	0 29 54.1	7.2	4.2	0.28
8	8 3	11 7 1.98	7 31 55.5	9.9	5.7	0.38	23	5 56	12 0 49.63	0 17 40.3	7.2	4.1	0.28
9	7 59	11 7 33.31	7 26 11.6	9.9	5.6	0.38	24	5 53	12 2 29.76	+0 5 21.4	7.1	4.1	0.27
10	7 56	11 8 6.93	7 20 14.7	9.8	5.6	0.38	25	5 51	12 4 10.82	-0 7 2.6	7.1	4.1	0.27
11	7 53	11 8 42.78	+7 14 5.1	9.7	5.6	0.37	26	5 49	12 5 52.79	-0 19 31.4	7.1	4.1	0.27
12	7 49	11 9 20.83	7 7 43.1	9.6	5.5	0.37	27	5 47	12 7 35.66	0 32 5.1	7.0	4.0	0.27
13	7 46	11 10 1.05	7 1 8.9	9.6	5.5	0.37	28	5 44	12 9 19.43	0 44 43.4	7.0	4.0	0.27
14	7 43	11 10 43.37	6 54 22.9	9.5	5.4	0.37	29	5 42	12 11 4.08	0 57 26.4	6.9	4.0	0.27
15	7 40	11 11 27.75	6 47 25.1	9.4	5.4	0.36	30	5 40	12 12 49.60	1 10 13.8	6.9	4.0	0.26
16	7 37	11 12 14.16	+6 40 15.8	9.3	5.4	0.36	July 1	5 38	12 14 35.99	-1 23 5.6	6.9	3.9	0.26
17	7 33	11 13 2.56	+6 32 55.3	9.3	5.3	0.36	2	5 36	12 16 23.24	-1 36 1.7	6.8	3.9	0.26

Stellar magnitude at opposition in March, 1918, -1.1.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam. S. T. of Sem. Pass. Mer.
Jan.	h m	h m s	" " "	"	" s	Feb. 16	h m	h m s	" " "	"	" s
1	9 19	4 2 16.51	+19 53 52.1	2.1	22.2 1.67	16	6 17	4 1 6.84	+20 1 54.9	1.8	19.2 1.46
2	9 14	4 1 56.59	19 53 10.3	2.1	22.1 1.67	17	6 13	4 1 24.60	20 2 59.1	1.8	19.2 1.45
3	9 10	4 1 37.41	19 52 30.5	2.1	22.0 1.66	18	6 9	4 1 43.12	20 4 5.1	1.8	19.1 1.44
4	9 6	4 1 18.98	19 51 52.9	2.1	22.0 1.66	19	6 6	4 2 2.39	20 5 13.1	1.8	19.1 1.44
5	9 2	4 1 1.31	19 51 17.4	2.0	21.9 1.66	20	6 2	4 2 22.40	20 6 22.9	1.8	19.0 1.44
6	8 57	4 0 44.41	+19 50 44.0	2.0	21.9 1.65	21	5 59	4 2 43.14	+20 7 34.6	1.8	18.9 1.43
7	8 53	4 0 28.29	19 50 12.8	2.0	21.8 1.65	22	5 55	4 3 4.62	20 8 48.0	1.8	18.9 1.43
8	8 49	4 0 12.96	19 49 43.8	2.0	21.8 1.64	23	5 51	4 3 26.82	20 10 3.2	1.8	18.8 1.42
9	8 45	3 59 58.43	19 49 17.1	2.0	21.7 1.64	24	5 48	4 3 49.73	20 11 20.1	1.8	18.8 1.42
10	8 41	3 59 44.71	19 48 52.7	2.0	21.6 1.63	25	5 44	4 4 13.36	20 12 38.6	1.7	18.7 1.41
11	8 37	3 59 31.80	+19 48 30.6	2.0	21.6 1.63	26	5 41	4 4 37.67	+20 13 58.8	1.7	18.6 1.41
12	8 32	3 59 19.72	19 48 10.8	2.0	21.5 1.62	27	5 37	4 5 2.68	20 15 20.5	1.7	18.6 1.41
13	8 28	3 59 8.47	19 47 53.4	2.0	21.5 1.62	28	5 34	4 5 28.38	20 16 43.8	1.7	18.5 1.40
14	8 24	3 58 58.06	19 47 38.5	2.0	21.4 1.61	Mar. 1	5 30	4 5 54.75	20 18 8.5	1.7	18.5 1.40
15	8 20	3 58 48.49	19 47 25.9	2.0	21.3 1.61	2	5 27	4 6 21.79	20 19 34.8	1.7	18.4 1.39
16	8 16	3 58 39.76	+19 47 15.8	2.0	21.3 1.60	3	5 23	4 6 49.49	+20 21 2.5	1.7	18.3 1.39
17	8 12	3 58 31.87	19 47 8.1	2.0	21.2 1.60	4	5 20	4 7 17.85	20 22 31.6	1.7	18.3 1.38
18	8 8	3 58 24.83	19 47 2.8	2.0	21.1 1.60	5	5 16	4 7 46.87	20 24 2.0	1.7	18.2 1.38
19	8 4	3 58 18.65	19 47 0.0	2.0	21.1 1.59	6	5 13	4 8 16.53	20 25 33.7	1.7	18.2 1.38
20	8 0	3 58 13.33	19 46 59.8	2.0	21.0 1.59	7	5 10	4 8 46.83	20 27 6.7	1.7	18.1 1.37
21	7 56	3 58 8.86	+19 47 2.0	2.0	21.0 1.58	8	5 6	4 9 17.76	+20 28 40.8	1.7	18.1 1.37
22	7 52	3 58 5.24	19 47 6.6	2.0	20.9 1.57	9	5 3	4 9 49.31	20 30 16.0	1.7	18.0 1.36
23	7 48	3 58 2.47	19 47 13.7	1.9	20.8 1.57	.....	.....	.....	.....	.....	.....
24	7 44	3 58 0.56	19 47 23.3	1.9	20.8 1.56	.....	.....	.....	.....	.....	.....
25	7 40	3 57 59.49	19 47 35.3	1.9	20.7 1.56	Sept. 9	19 35	6 49 41.63	+22 46 37.7	1.6	17.2 1.32
26	7 36	3 57 59.28	+19 47 49.7	1.9	20.6 1.55	10	19 31	6 50 20.08	+22 45 56.5	1.6	17.2 1.33
27	7 32	3 57 59.91	19 48 6.5	1.9	20.6 1.55	11	19 28	6 50 57.99	22 45 15.4	1.6	17.3 1.33
28	7 28	3 58 1.39	19 48 25.9	1.9	20.5 1.55	12	19 25	6 51 35.37	22 44 34.5	1.6	17.3 1.33
29	7 24	3 58 3.72	19 48 47.7	1.9	20.4 1.54	13	19 22	6 52 12.20	22 43 53.7	1.6	17.4 1.34
30	7 20	3 58 6.90	19 49 11.8	1.9	20.4 1.54	14	19 18	6 52 48.47	22 43 13.0	1.6	17.4 1.34
31	7 17	3 58 10.91	+19 49 38.4	1.9	20.3 1.53	15	19 15	6 53 24.19	+22 42 32.6	1.6	17.5 1.34
Feb. 1	7 13	3 58 15.75	19 50 7.4	1.9	20.2 1.53	16	19 12	6 53 59.34	22 41 52.3	1.6	17.5 1.35
2	7 9	3 58 21.43	19 50 38.7	1.9	20.2 1.52	17	19 8	6 54 33.91	22 41 12.4	1.6	17.6 1.35
3	7 5	3 58 27.94	19 51 12.4	1.9	20.1 1.52	18	19 5	6 55 7.91	22 40 32.8	1.6	17.6 1.35
4	7 1	3 58 35.28	19 51 48.4	1.9	20.0 1.51	19	19 1	6 55 41.32	22 39 53.5	1.6	17.7 1.36
5	6 57	3 58 43.45	+19 52 26.8	1.9	20.0 1.51	20	18 58	6 56 14.14	+22 39 14.6	1.7	17.7 1.36
6	6 54	3 58 52.45	19 53 7.4	1.9	19.9 1.50	21	18 55	6 56 46.36	22 38 36.1	1.7	17.8 1.37
7	6 50	3 59 2.26	19 53 50.3	1.9	19.8 1.50	22	18 51	6 57 17.97	22 37 58.1	1.7	17.8 1.37
8	6 46	3 59 12.89	19 54 35.6	1.8	19.8 1.49	23	18 48	6 57 48.96	22 37 20.5	1.7	17.9 1.37
9	6 42	3 59 24.35	19 55 23.0	1.8	19.7 1.49	24	18 44	6 58 19.33	22 36 43.4	1.7	17.9 1.38
10	6 39	3 59 36.60	+19 56 12.7	1.8	19.6 1.48	25	18 41	6 58 49.07	+22 36 6.8	1.7	18.0 1.38
11	6 35	3 59 49.66	19 57 4.4	1.8	19.6 1.48	26	18 38	6 59 18.16	22 35 30.8	1.7	18.0 1.39
12	6 31	4 0 3.52	19 57 58.3	1.8	19.5 1.47	27	18 34	6 59 46.60	22 34 55.5	1.7	18.1 1.39
13	6 28	4 0 18.18	19 58 54.4	1.8	19.4 1.47	28	18 31	7 0 14.39	22 34 20.8	1.7	18.1 1.39
14	6 24	4 0 33.62	19 59 52.6	1.8	19.4 1.46	29	18 27	7 0 41.51	22 33 46.8	1.7	18.2 1.40
15	6 20	4 0 49.84	+20 0 52.7	1.8	19.3 1.46	30	18 24	7 1 7.95	+22 33 13.6	1.7	18.2 1.40
16/6 17	4 1 6.84	+20 1 54.9	1.8	19.2 1.46	Oct. 1	18 20	7 1 33.72	+22 32 41.1	1.7	18.3 1.41	

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. P. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. P. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	18 20	7 1 33.72	+22 32 41.1	1.7	18.31	1.41	Nov. 15	15 29	7 7 28.84	+22 28 11.5	2.0	20.9	1.61
2	18 17	7 1 58.79	22 32 9.4	1.7	18.31	1.41	16	15 25	7 7 17.57	22 28 36.8	2.0	21.0	1.61
3	18 13	7 2 23.16	22 31 38.5	1.7	18.41	1.41	17	15 21	7 7 5.47	22 29 3.5	2.0	21.0	1.62
4	18 10	7 2 46.82	22 31 8.4	1.7	18.41	1.42	18	15 17	7 6 52.56	22 29 31.5	2.0	21.1	1.62
5	18 6	7 3 9.77	22 30 39.2	1.7	18.51	1.42	19	15 12	7 6 38.82	22 30 0.8	2.0	21.1	1.62
6	18 2	7 3 32.00	+22 30 11.0	1.7	18.61	1.43	20	15 8	7 6 24.27	+22 30 31.2	2.0	21.2	1.63
7	17 59	7 3 53.49	22 29 43.8	1.7	18.61	1.43	21	15 4	7 6 8.92	22 31 3.0	2.0	21.2	1.63
8	17 55	7 4 14.25	22 29 17.6	1.7	18.71	1.43	22	15 0	7 5 52.77	22 31 36.1	2.0	21.3	1.64
9	17 52	7 4 34.28	22 28 52.3	1.8	18.71	1.44	23	14 56	7 5 35.82	22 32 10.3	2.0	21.3	1.64
10	17 48	7 4 53.56	22 28 28.1	1.8	18.81	1.44	24	14 52	7 5 18.08	22 32 45.7	2.0	21.4	1.64
11	17 44	7 5 12.08	+22 28 4.9	1.8	18.81	1.45	25	14 47	7 4 59.57	+22 33 22.1	2.0	21.4	1.65
12	17 41	7 5 29.85	22 27 42.9	1.8	18.91	1.45	26	14 43	7 4 40.29	22 33 59.6	2.0	21.5	1.65
13	17 37	7 5 46.86	22 27 21.9	1.8	19.01	1.46	27	14 39	7 4 20.25	22 34 38.3	2.0	21.5	1.66
14	17 33	7 6 3.09	22 27 2.0	1.8	19.01	1.46	28	14 34	7 3 59.46	22 35 18.0	2.0	21.6	1.66
15	17 30	7 6 18.54	22 26 43.3	1.8	19.11	1.47	29	14 30	7 3 37.94	22 35 58.6	2.0	21.6	1.67
16	17 26	7 6 33.22	+22 26 25.8	1.8	19.11	1.47	30	14 26	7 3 15.71	+22 36 40.2	2.0	21.7	1.67
17	17 22	7 6 47.12	22 26 9.5	1.8	19.21	1.47	Dec. 1	14 22	7 2 52.77	22 37 22.7	2.0	21.7	1.67
18	17 19	7 7 0.23	22 25 54.4	1.8	19.31	1.48	2	14 17	7 2 29.13	22 38 6.1	2.0	21.8	1.68
19	17 15	7 7 12.54	22 25 40.5	1.8	19.31	1.48	3	14 13	7 2 4.82	22 38 50.3	2.0	21.8	1.68
20	17 11	7 7 24.06	22 25 28.0	1.8	19.41	1.49	4	14 9	7 1 39.84	22 39 35.3	2.0	21.9	1.68
21	17 7	7 7 34.76	+22 25 16.7	1.8	19.41	1.49	5	14 4	7 1 14.22	+22 40 21.0	2.0	21.9	1.69
22	17 4	7 7 44.66	22 25 6.8	1.8	19.51	1.50	6	14 0	7 0 47.97	22 41 7.4	2.0	21.9	1.69
23	17 0	7 7 53.73	22 24 58.1	1.8	19.61	1.50	7	13 56	7 0 21.10	22 41 54.4	2.1	22.0	1.69
24	16 56	7 8 1.99	22 24 50.7	1.8	19.61	1.51	8	13 51	6 59 53.64	22 42 42.0	2.1	22.0	1.70
25	16 52	7 8 9.41	22 24 44.8	1.8	19.71	1.51	9	13 47	6 59 25.61	22 43 30.1	2.1	22.0	1.70
26	16 48	7 8 16.00	+22 24 40.2	1.8	19.71	1.52	10	13 42	6 58 57.05	+22 44 18.8	2.1	22.1	1.70
27	16 45	7 8 21.76	22 24 37.1	1.8	19.81	1.52	11	13 38	6 58 27.95	22 45 7.9	2.1	22.1	1.70
28	16 41	7 8 26.67	22 24 35.5	1.9	19.81	1.52	12	13 34	6 57 58.33	22 45 57.4	2.1	22.1	1.70
29	16 37	7 8 30.73	22 24 35.3	1.9	19.91	1.53	13	13 29	6 57 28.21	22 46 47.3	2.1	22.2	1.71
30	16 33	7 8 33.94	22 24 36.5	1.9	20.01	1.53	14	13 25	6 56 57.63	22 47 37.5	2.1	22.2	1.71
31	16 29	7 8 36.29	+22 24 39.1	1.9	20.01	1.54	15	13 20	6 56 26.61	+22 48 27.8	2.1	22.2	1.71
Nov. 1	16 25	7 8 37.79	22 24 43.1	1.9	20.11	1.54	16	13 16	6 55 55.16	22 49 18.3	2.1	22.2	1.71
2	16 21	7 8 38.44	22 24 48.6	1.9	20.21	1.55	17	13 11	6 55 23.31	22 50 9.1	2.1	22.3	1.72
3	16 17	7 8 38.22	22 24 55.5	1.9	20.21	1.55	18	13 7	6 54 51.07	22 50 59.9	2.1	22.3	1.72
4	16 13	7 8 37.15	22 25 4.0	1.9	20.31	1.56	19	13 2	6 54 18.46	22 51 50.9	2.1	22.3	1.72
5	16 9	7 8 35.21	+22 25 13.9	1.9	20.31	1.56	20	12 58	6 53 45.51	+22 52 41.8	2.1	22.3	1.72
6	16 5	7 8 32.42	22 25 25.2	1.9	20.41	1.57	21	12 53	6 53 12.24	22 53 32.8	2.1	22.4	1.72
7	16 1	7 8 28.76	22 25 38.1	1.9	20.51	1.57	22	12 49	6 52 38.68	22 54 23.7	2.1	22.4	1.72
8	15 57	7 8 24.25	22 25 52.4	1.9	20.51	1.58	23	12 44	6 52 4.87	22 55 14.4	2.1	22.4	1.73
9	15 53	7 8 18.88	22 26 8.1	1.9	20.61	1.58	24	12 40	6 51 30.81	22 56 5.0	2.1	22.4	1.73
10	15 49	7 8 12.65	+22 26 25.2	1.9	20.61	1.58	25	12 35	6 50 56.51	+22 56 55.5	2.1	22.4	1.73
11	15 45	7 8 5.57	22 26 43.7	1.9	20.71	1.59	26	12 31	6 50 22.03	22 57 45.8	2.1	22.4	1.73
12	15 41	7 7 57.65	22 27 3.6	1.9	20.71	1.59	27	12 26	6 49 47.40	22 58 35.9	2.1	22.4	1.73
13	15 37	7 7 48.88	22 27 24.9	1.9	20.81	1.60	28	12 22	6 49 12.61	22 59 25.7	2.1	22.4	1.73
14	15 33	7 7 39.27	22 27 47.5	2.0	20.91	1.60	29	12 17	6 48 37.71	23 0 15.1	2.1	22.4	1.73
15	15 29	7 7 28.84	+22 28 11.5	2.0	20.91	1.61	30	12 13	6 48 2.73	+23 1 4.0	2.1	22.4	1.73
16	15 25	7 7 17.57	+22 28 36.8	2.0	21.01	1.61	31	12 8	6 47 27.69	+23 1 52.8	2.1	22.4	1.73

Stellar magnitude at opposition in January, 1919, -2.3.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam. S. T. of Sem. Trans. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam. S. T. of Sem. Trans. Mer.
Jan. 0	h m s	h m s	" "	" "	" "	Feb. 15	h m s	h m s	" "	" "	" "
1	14 24 0	4 20.74	+17 34 51.0	0.2	9.4 0.72	16	11 9 8	50 15.85	+18 38 29.6	1.1	9.5 0.72
2	14 20 0	4 0.11	17 30 3.1	0.2	9.4 0.72	17	11 5 8	49 57.43	18 39 46.9	1.1	9.5 0.72
3	14 16 0	3 51.10	17 37 16.4	0.2	9.4 0.72	18	11 0 8	49 39.19	18 41 3.4	1.1	9.5 0.72
4	14 11 0	3 36.96	17 38 30.7	0.2	9.4 0.72	19	10 56 8	49 21.15	18 42 18.7	1.1	9.5 0.72
5	14 7 0	3 20.43	17 39 46.2	0.2	9.4 0.72	20	10 52 8	49 3.31	18 43 33.1	1.1	9.5 0.72
6	14 3 0	3 4.02	+17 41 2.8	0.2	9.4 0.72	21	10 48 8	48 45.67	+18 44 46.5	1.1	9.4 0.72
7	13 59 0	2 48.53	17 42 20.3	0.2	9.4 0.72	22	10 44 8	48 28.25	18 45 58.8	1.1	9.4 0.72
8	13 55 0	2 32.19	17 43 38.9	0.2	9.4 0.72	23	10 39 8	48 11.05	18 47 9.9	1.1	9.4 0.72
9	13 51 0	2 15.57	17 44 58.3	0.2	9.4 0.72	24	10 35 8	47 54.07	18 48 20.0	1.1	9.4 0.72
10	13 47 0	1 58.72	17 46 18.5	0.2	9.4 0.73	25	10 31 8	47 37.35	18 49 28.8	1.1	9.4 0.72
11	13 43 0	1 41.62	+17 47 39.6	0.2	9.4 0.73	26	10 27 8	47 20.88	+18 50 36.4	1.1	9.4 0.72
12	13 38 0	1 24.27	17 49 1.5	0.2	9.4 0.73	27	10 22 8	47 4.66	18 51 42.8	1.1	9.4 0.72
13	13 33 0	1 0.72	17 50 24.0	0.2	9.5 0.73	28	10 18 8	46 48.71	18 52 48.0	1.1	9.4 0.72
14	13 29 0	0 48.96	17 51 47.3	0.2	9.5 0.73	29	10 14 8	46 33.03	18 53 51.9	1.1	9.4 0.72
15	13 25 0	0 31.00	17 53 11.1	0.2	9.5 0.73	Mar. 1	10 10 8	46 17.64	18 54 54.4	1.1	9.4 0.72
16	13 21 0	0 12.85	+17 54 35.4	0.2	9.5 0.73	2	10 6 8	46 2.54	+18 55 55.5	1.1	9.4 0.72
17	13 16 8	59 54.52	17 56 0.4	1.1	9.5 0.73	3	10 2 8	45 47.75	18 56 55.4	1.1	9.3 0.72
18	13 12 8	59 36.03	17 57 25.8	1.1	9.5 0.73	4	9 57 8	45 33.25	18 57 53.9	1.1	9.3 0.72
19	13 8 8	59 17.37	17 58 51.7	1.1	9.5 0.73	5	9 53 8	45 19.07	18 58 51.0	1.1	9.3 0.72
20	13 4 8	58 58.56	18 0 17.9	1.1	9.5 0.73	6	9 49 8	45 5.22	18 59 46.7	1.1	9.3 0.71
21	12 59 8	58 39.64	+18 1 44.3	1.1	9.5 0.73	7	9 45 8	44 51.69	+19 0 41.0	1.1	9.3 0.71
22	12 55 8	58 20.58	18 3 11.1	1.1	9.5 0.73	8	9 41 8	44 38.52	19 1 33.6	1.1	9.3 0.71
23	12 51 8	58 1.42	18 4 38.0	1.1	9.5 0.73	9	9 37 8	44 25.66	19 2 24.5	1.1	9.3 0.71
24	12 47 8	57 42.15	18 6 3.1	1.1	9.5 0.73	10	9 32 8	44 13.26	19 3 14.6	1.1	9.3 0.71
25	12 42 8	57 22.78	18 7 32.4	1.1	9.5 0.73	11	9 28 8	44 1.06	19 4 2.7	1.0	9.2 0.71
26	12 38 8	57 3.34	+18 8 39.8	1.1	9.5 0.73	12	9 24 8	43 49.30	+19 4 48.2	1.0	9.2 0.71
27	12 34 8	56 43.88	18 10 27.1	1.1	9.5 0.73	13	9 20 8	43 37.97	19 5 38.8	1.0	9.2 0.71
28	12 30 8	56 24.23	18 11 34.5	1.1	9.5 0.73	14	9 16 8	43 26.97	19 6 31.1	1.0	9.2 0.71
29	12 25 8	56 4.63	18 13 21.8	1.1	9.5 0.73	15	9 12 8	43 16.22	19 7 20.1	1.0	9.2 0.71
30	12 21 8	55 44.97	18 14 46.6	1.1	9.5 0.73	16	9 8 8	43 6.24	19 8 6.1	1.0	9.2 0.71
31	12 17 8	55 25.27	18 16 15.9	1.1	9.5 0.73	17	9 4 8	42 56.28	19 9 16.1	1.0	9.2 0.71
32	12 13 8	55 5.57	18 17 42.8	1.1	9.5 0.73	18	9 0 8	42 46.31	19 10 25.1	1.0	9.2 0.71
33	12 9 8	54 55.87	18 19 3.3	1.1	9.5 0.73	19	8 56 8	42 36.37	19 11 34.1	1.0	9.2 0.71
34	12 5 8	54 36.17	18 20 36.8	1.1	9.5 0.73	20	8 52 8	42 26.47	19 12 43.1	1.0	9.2 0.71
35	12 1 8	54 16.46	18 22 18.1	1.1	9.5 0.73	21	8 48 8	42 16.62	19 13 52.1	1.0	9.2 0.71
36	11 57 8	53 56.74	18 23 27.1	1.1	9.5 0.73	22	8 44 8	42 6.82	19 14 5.1	1.0	9.2 0.71
37	11 53 8	53 37.03	18 24 42.1	1.1	9.5 0.73	23	8 40 8	41 57.07	19 15 18.1	1.0	9.2 0.71
38	11 49 8	53 17.32	18 26 1.1	1.1	9.5 0.73	24	8 36 8	41 47.37	19 16 31.1	1.0	9.2 0.71
39	11 45 8	52 57.61	18 27 16.1	1.1	9.5 0.73	25	8 32 8	41 37.72	19 17 44.1	1.0	9.2 0.71
40	11 41 8	52 37.90	18 28 31.1	1.1	9.5 0.73	26	8 28 8	41 28.12	19 18 57.1	1.0	9.2 0.71
41	11 37 8	52 18.19	18 29 46.1	1.1	9.5 0.73	27	8 24 8	41 18.57	19 20 10.1	1.0	9.2 0.71
42	11 33 8	51 9.48	18 31 1.1	1.1	9.5 0.73	28	8 20 8	41 9.07	19 21 23.1	1.0	9.2 0.71
43	11 29 8	50 49.77	18 32 16.1	1.1	9.5 0.73	29	8 16 8	41 0.02	19 22 36.1	1.0	9.2 0.71
44	11 25 8	50 30.06	18 33 31.1	1.1	9.5 0.73	30	8 12 8	40 50.52	19 23 49.1	1.0	9.2 0.71
45	11 21 8	50 10.35	18 34 46.1	1.1	9.5 0.73	31	8 8 8	40 41.07	19 25 2.1	1.0	9.2 0.71
46	11 17 8	49 50.64	18 36 1.1	1.1	9.5 0.73	32	8 4 8	40 31.62	19 26 15.1	1.0	9.2 0.71
47	11 13 8	49 30.93	18 37 16.1	1.1	9.5 0.73	33	8 0 8	40 22.17	19 27 28.1	1.0	9.2 0.71
48	11 9 8	49 11.22	18 38 31.1	1.1	9.5 0.73	34	7 56 8	40 12.72	19 28 41.1	1.0	9.2 0.71
49	11 5 8	48 51.51	18 39 46.1	1.1	9.5 0.73	35	7 52 8	40 3.27	19 29 54.1	1.0	9.2 0.71
50	11 1 8	48 31.80	18 41 1.1	1.1	9.5 0.73	36	7 48 8	40 0.02	19 31 7.1	1.0	9.2 0.71
51	10 57 8	48 12.09	18 42 16.1	1.1	9.5 0.73	37	7 44 8	39 50.57	19 32 20.1	1.0	9.2 0.71
52	10 53 8	47 52.38	18 43 31.1	1.1	9.5 0.73	38	7 40 8	39 41.12	19 33 33.1	1.0	9.2 0.71
53	10 49 8	47 32.67	18 44 46.1	1.1	9.5 0.73	39	7 36 8	39 31.67	19 34 46.1	1.0	9.2 0.71
54	10 45 8	47 12.96	18 46 1.1	1.1	9.5 0.73	40	7 32 8	39 22.22	19 35 59.1	1.0	9.2 0.71
55	10 41 8	46 53.25	18 47 16.1	1.1	9.5 0.73	41	7 28 8	39 12.77	19 37 12.1	1.0	9.2 0.71
56	10 37 8	46 33.54	18 48 31.1	1.1	9.5 0.73	42	7 24 8	39 0.02	19 38 25.1	1.0	9.2 0.71
57	10 33 8	46 13.83	18 49 46.1	1.1	9.5 0.73	43	7 20 8	38 50.57	19 39 38.1	1.0	9.2 0.71
58	10 29 8	45 54.12	18 51 1.1	1.1	9.5 0.73	44	7 16 8	38 41.12	19 40 51.1	1.0	9.2 0.71
59	10 25 8	45 34.41	18 52 16.1	1.1	9.5 0.73	45	7 12 8	38 31.67	19 42 4.1	1.0	9.2 0.71
60	10 21 8	45 14.70	18 53 31.1	1.1	9.5 0.73	46	7 8 8	38 22.22	19 43 17.1	1.0	9.2 0.71
61	10 17 8	44 54.99	18 54 46.1	1.1	9.5 0.73	47	7 4 8	38 12.77	19 44 30.1	1.0	9.2 0.71
62	10 13 8	44 35.28	18 56 1.1	1.1	9.5 0.73	48	7 0 8	38 0.02	19 45 43.1	1.0	9.2 0.71
63	10 9 8	44 15.57	18 57 16.1	1.1	9.5 0.73	49	6 56 8	37 50.57	19 46 56.1	1.0	9.2 0.71
64	10 5 8	43 55.86	18 58 31.1	1.1	9.5 0.73	50	6 52 8	37 41.12	19 48 9.1	1.0	9.2 0.71
65	10 1 8	43 36.15	18 59 46.1	1.1	9.5 0.73	51	6 48 8	37 31.67	19 49 22.1	1.0	9.2 0.71
66	9 57 8	43 16.44	19 0 1.1	1.1	9.5 0.73	52	6 44 8	37 22.22	19 50 35.1	1.0	9.2 0.71
67	9 53 8	42 56.73	19 1 16.1	1.1	9.5 0.73	53	6 40 8	37 12.77	19 51 48.1	1.0	9.2 0.71
68	9 49 8	42 37.02	19 2 31.1	1.1	9.5 0.73	54	6 36 8	37 0.02	19 53 1.1	1.0	9.2 0.71
69	9 45 8	42 17.31	19 3 46.1	1.1	9.5 0.73	55	6 32 8	36 50.57	19 54 14.1	1.0	9.2 0.71
70	9 41 8	41 9.80	19 4 1.1	1.1	9.5 0.73	56	6 28 8	36 41.12	19 55 27.1	1.0	9.2 0.71
71	9 37 8	40 50.09	19 5 16.1	1.1	9.5 0.73	57	6 24 8	36 31.67	19 56 40.1	1.0	9.2 0.71
72	9 33 8	40 30.38	19 6 31.1	1.1	9.5 0.73	58	6 20 8	36 22.22	19 57 53.1	1.0	9.2 0.71
73	9 29 8	40 10.67	19 7 46.1	1.1	9.5 0.73	59	6 16 8	36 12.77	19 59 6.1	1.0	9.2 0.71
74	9 25 8	39 50.96	19 9 1.1	1.1	9.5 0.73	60	6 12 8	36 0.02	19 60 19.1	1.0	9.2 0.71
75	9 21 8	39 31.25	19 10 16.1	1.1	9.5 0.73	61	6 8 8	35 50.57	19 61 32.1	1.0	9.2 0.71
76	9 17 8	39 11.54	19 11 31.1	1.1	9.5 0.73	62	6 4 8	35 41.12	19 62 45.1	1.0	9.2 0.71
77	9 13 8	38 51.83	19 12 46.1	1.1	9.5 0.73	63	6 0 8	35 31.67	19 63 58.1	1.0	9.2 0.71
78	9 9 8	38 32.12	19 14 1.1	1.1	9.5 0.73	64	5 56 8	35 22.22	19 65 11.1	1.0	9.2 0.71
79	9 5 8	38 12.41	19 15 16.1	1.1	9.5 0.73	65	5 52 8	35 12.77	19 66 24.1	1.0	9.2 0.71
80	9 1 8	37 52.70	19 16 31.1	1.1	9.5 0.73	66	5 48 8	35 0.02	19 67 37.1	1.0	9.2 0.71
81	8 57 8	37 33.00	19 17 46.1	1.1	9.5 0.73	67	5 44 8	34 50.57	19 68 50.1	1.0	9.2 0.71
82	8 53 8	37 13.29	19 19 1.1	1.1	9.5 0.73	68	5 40 8	34 41.12	19 70 3.1	1.0	9.2 0.71
83	8 49 8	36 53.58	19 20 16.1	1.1	9.5 0.73	69	5 36 8	34 31.67	19 71 16.1	1.0	9.2 0.71
84	8 45 8	36 33.87	19 21 31.1	1.1	9.5 0.73	70	5 32 8	34 22.22	19 72 29.1	1.0	9.2 0.71
85	8 41 8	36 14.16	19 22 46.1	1.1	9.5 0.73	71	5 28 8	34 12.77	19 73 42.1	1.0	9.2 0.71
86	8 37 8	35 54.45	19 24 1.1	1.1	9.5 0.73	72	5 24 8	34 0.02	19 74 55.1	1.0	9.2 0.71
87	8 33 8										

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam. S. T. of Sem. Pass. Mer.
	h m s	h m s	" " "	"	" s		h m s	h m s	" " "	"	" s
pr. 1	8 3	8 41 18.14	+19 14 38.2	1.0	9.0 0.69	Nov. 15	18 22 10	1 23.94	+13 22 40.2	1.0	8.4 0.63
2	7 59	8 41 15.03	19 14 50.0	1.0	8.9 0.69	16	18 19 10	1 33.90	13 22 0.1	1.0	8.4 0.63
3	7 55	8 41 12.35	19 15 0.0	1.0	8.9 0.69	17	18 15 10	1 43.47	13 21 22.2	1.0	8.4 0.64
4	7 51	8 41 10.12	19 15 8.3	1.0	8.9 0.69	18	18 11 10	1 52.64	13 20 46.3	1.0	8.4 0.64
5	7 47	8 41 8.32	19 15 15.0	1.0	8.9 0.68	19	18 7 10	2 1.40	13 20 12.8	1.0	8.5 0.64
6	7 43	8 41 6.97	+19 15 19.9	1.0	8.9 0.68	20	18 4 10	2 9.77	+13 19 41.5	1.0	8.5 0.64
7	7 39	8 41 6.07	19 15 23.1	1.0	8.9 0.68	21	18 0 10	2 17.72	13 19 12.3	1.0	8.5 0.64
8	7 35	8 41 5.61	19 15 24.6	1.0	8.8 0.68	22	17 56 10	2 25.27	13 18 45.4	1.0	8.5 0.64
9	7 31	8 41 5.59	19 15 24.3	1.0	8.8 0.68	23	17 52 10	2 32.40	13 18 20.7	1.0	8.5 0.64
10	7 27	8 41 6.02	19 15 22.3	1.0	8.8 0.68	24	17 48 10	2 39.12	13 17 58.3	1.0	8.5 0.64
11	7 23	8 41 6.91	+19 15 18.7	1.0	8.8 0.68	25	17 44 10	2 45.42	+13 17 38.2	1.0	8.6 0.65
12	7 20	8 41 8.23	19 15 13.3	1.0	8.8 0.68	26	17 41 10	2 51.31	13 17 20.5	1.0	8.6 0.65
13	7 16	8 41 10.01	19 15 6.2	1.0	8.8 0.67	27	17 37 10	2 56.77	13 17 5.0	1.0	8.6 0.65
14	7 12	8 41 12.22	19 14 57.4	1.0	8.7 0.67	28	17 33 10	3 1.81	13 16 51.8	1.0	8.6 0.65
15	7 8	8 41 14.88	19 14 46.8	1.0	8.7 0.67	29	17 29 10	3 6.44	13 16 40.9	1.0	8.6 0.65
16	7 4	8 41 17.99	+19 14 34.5	1.0	8.7 0.67	30	17 25 10	3 10.63	+13 16 32.5	1.0	8.6 0.65
17	7 0	8 41 21.53	19 14 20.7	1.0	8.7 0.67	Dec. 1	17 21 10	3 14.40	13 16 26.3	1.0	8.6 0.65
18	6 56	8 41 25.51	19 14 5.0	1.0	8.7 0.67	2	17 18 10	3 17.72	13 16 22.4	1.0	8.7 0.65
19	6 52	8 41 29.93	19 13 47.8	1.0	8.7 0.67	3	17 14 10	3 20.61	13 16 20.9	1.0	8.7 0.65
20	6 49	8 41 34.79	19 13 28.8	1.0	8.7 0.67	4	17 10 10	3 23.09	13 16 21.8	1.0	8.7 0.65
21	6 45	8 41 40.08	+19 13 8.2	1.0	8.6 0.67	5	17 6 10	3 25.13	+13 16 24.9	1.0	8.7 0.66
22	6 41	8 41 45.80	19 12 46.0	1.0	8.6 0.66	6	17 2 10	3 26.74	13 16 30.4	1.0	8.7 0.66
23	6 37	8 41 51.94	19 12 22.1	1.0	8.6 0.66	7	16 58 10	3 27.90	13 16 38.3	1.0	8.7 0.66
24	6 33	8 41 58.52	19 11 56.6	1.0	8.6 0.66	8	16 54 10	3 28.64	13 16 48.4	1.0	8.8 0.66
25	6 29	8 42 5.52	19 11 29.4	1.0	8.6 0.66	9	16 50 10	3 28.97	13 17 0.9	1.0	8.8 0.66
26	6 26	8 42 12.94	+19 11 0.7	1.0	8.6 0.66	10	16 46 10	3 28.84	+13 17 15.8	1.0	8.8 0.66
27	6 22	8 42 20.79	19 10 30.3	1.0	8.5 0.66	11	16 42 10	3 28.29	13 17 33.0	1.0	8.8 0.66
28	6 18	8 42 29.05	19 9 58.3	1.0	8.5 0.66	12	16 38 10	3 27.32	13 17 52.4	1.0	8.8 0.66
29	6 14	8 42 37.72	19 9 24.8	1.0	8.5 0.65	13	16 34 10	3 25.91	13 18 14.1	1.0	8.8 0.67
30	6 10	8 42 46.81	19 8 49.6	1.0	8.5 0.65	14	16 30 10	3 24.09	13 18 38.1	1.0	8.9 0.67
ay 1	6 7	8 42 56.31	+19 8 12.8	1.0	8.5 0.65	15	16 27 10	3 21.85	+13 19 4.4	1.0	8.9 0.67
.....	.....	.....	.....	.....	.....	16	16 23 10	3 19.17	13 19 33.0	1.0	8.9 0.67
.....	.....	.....	.....	.....	.....	17	16 19 10	3 16.07	13 20 3.8	1.0	8.9 0.67
ov. 2	19 11	9 58 39.47	+13 34 31.1	0.9	8.2 0.62	18	16 15 10	3 12.55	13 20 36.9	1.0	8.9 0.67
3	19 7	9 58 54.35	13 33 24.4	0.9	8.2 0.62	19	16 11 10	3 8.61	13 21 12.1	1.0	8.9 0.67
4	19 4	9 59 8.87	+13 32 19.6	0.9	8.2 0.62	20	16 7 10	3 4.25	+13 21 49.7	1.0	9.0 0.68
5	19 0	9 59 23.02	13 31 16.7	0.9	8.3 0.62	21	16 3 10	2 59.48	13 22 29.4	1.0	9.0 0.68
6	18 56	9 59 36.81	13 30 15.9	0.9	8.3 0.62	22	15 59 10	2 54.29	13 23 11.3	1.0	9.0 0.68
7	18 52	9 59 50.23	13 29 17.1	0.9	8.3 0.63	23	15 54 10	2 48.69	13 23 55.3	1.0	9.0 0.68
8	18 49	10 0 3.28	13 28 20.3	0.9	8.3 0.63	24	15 50 10	2 42.67	13 24 41.6	1.0	9.0 0.68
9	18 45	10 0 15.95	+13 27 25.4	0.9	8.3 0.63	25	15 46 10	2 36.24	+13 25 30.0	1.0	9.0 0.68
10	18 41	10 0 28.24	13 26 32.7	0.9	8.3 0.63	26	15 42 10	2 29.42	13 26 20.5	1.0	9.0 0.68
11	18 38	10 0 40.15	13 25 42.0	0.9	8.3 0.63	27	15 38 10	2 22.19	13 27 13.1	1.0	9.0 0.68
12	18 34	10 0 51.68	13 24 53.3	0.9	8.4 0.63	28	15 34 10	2 14.55	13 28 7.8	1.0	9.1 0.68
13	18 30	10 1 2.82	13 24 6.8	1.0	8.4 0.63	29	15 30 10	2 6.52	13 29 4.5	1.0	9.1 0.68
14	18 26	10 1 13.58	+13 23 22.4	1.0	8.4 0.63	30	15 26 10	1 58.10	+13 30 3.2	1.0	9.1 0.68
15	18 22	10 1 23.94	+13 22 40.2	1.0	8.4 0.63	31	15 22 10	1 49.29	+13 31 4.0	1.0	9.1 0.68

Stellar magnitude at opposition in January, 1918, 0.0.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
June 10	16 45	22 033.03	-12 59 0.2	0.5	1.7	0.12	July 26	13 40	21 56 31.13	-13 22 0.6	0.5	1.8	0.12
11	16 41	22 031.35	12 59 11.7	0.5	1.7	0.12	27	13 36	21 56 22.90	13 22 45.4	0.5	1.8	0.12
12	16 37	22 029.49	12 59 24.2	0.5	1.7	0.12	28	13 32	21 56 14.60	13 23 30.6	0.5	1.8	0.12
13	16 33	22 027.44	12 59 37.6	0.5	1.7	0.12	29	13 28	21 56 6.21	13 24 16.1	0.5	1.8	0.12
14	16 29	22 025.21	12 59 51.9	0.5	1.7	0.12	30	13 24	21 55 57.73	13 25 2.0	0.5	1.8	0.12
15	16 25	22 022.81	-13 0 7.2	0.5	1.7	0.12	31	13 20	21 55 49.19	-13 25 48.2	0.5	1.8	0.12
16	16 21	22 020.23	13 0 23.4	0.5	1.7	0.12	Aug. 1	13 16	21 55 40.58	13 26 34.7	0.5	1.8	0.12
17	16 17	22 017.48	13 0 40.6	0.5	1.7	0.12	2	13 11	21 55 31.90	13 27 21.6	0.5	1.8	0.12
18	16 13	22 014.55	13 0 58.6	0.5	1.7	0.12	3	13 7	21 55 23.16	13 28 8.6	0.5	1.8	0.12
19	16 9	22 011.45	13 1 17.6	0.5	1.7	0.12	4	13 3	21 55 14.36	13 28 56.0	0.5	1.8	0.12
20	16 5	22 0 8.18	-13 1 37.5	0.5	1.7	0.12	5	12 59	21 55 5.50	-13 29 43.5	0.5	1.8	0.12
21	16 1	22 0 4.73	13 1 58.2	0.5	1.7	0.12	6	12 55	21 54 56.59	13 30 31.2	0.5	1.8	0.12
22	15 57	22 0 1.11	13 2 19.9	0.5	1.7	0.12	7	12 51	21 54 47.64	13 31 19.2	0.5	1.8	0.12
23	15 53	21 59 57.33	13 2 42.4	0.5	1.7	0.12	8	12 47	21 54 38.63	13 32 7.3	0.5	1.8	0.12
24	15 49	21 59 53.39	13 3 5.8	0.5	1.7	0.12	9	12 43	21 54 29.59	13 32 55.6	0.5	1.8	0.12
25	15 45	21 59 49.28	-13 3 30.0	0.5	1.7	0.12	10	12 39	21 54 20.50	-13 33 44.0	0.5	1.8	0.12
26	15 41	21 59 45.01	13 3 55.1	0.5	1.7	0.12	11	12 35	21 54 11.39	13 34 32.5	0.5	1.8	0.12
27	15 37	21 59 40.57	13 4 21.0	0.5	1.7	0.12	12	12 31	21 54 2.25	13 35 21.1	0.5	1.8	0.12
28	15 33	21 59 35.98	13 4 47.7	0.5	1.7	0.12	13	12 26	21 53 53.08	13 36 9.7	0.5	1.8	0.12
29	15 29	21 59 31.22	13 5 15.3	0.5	1.7	0.12	14	12 22	21 53 43.89	13 36 58.3	0.5	1.8	0.12
30	15 25	21 59 26.32	-13 5 43.6	0.5	1.7	0.12	15	12 18	21 53 34.69	-13 37 47.0	0.5	1.8	0.12
July 1	15 21	21 59 21.26	13 6 12.8	0.5	1.7	0.12	16	12 14	21 53 25.47	13 38 35.7	0.5	1.8	0.12
2	15 17	21 59 16.04	13 6 42.8	0.5	1.7	0.12	17	12 10	21 53 16.23	13 39 24.4	0.5	1.8	0.12
3	15 13	21 59 10.68	13 7 13.5	0.5	1.7	0.12	18	12 6	21 53 6.99	13 40 13.1	0.5	1.8	0.12
4	15 9	21 59 5.16	13 7 45.0	0.5	1.7	0.12	19	12 2	21 52 57.75	13 41 1.6	0.5	1.8	0.12
5	15 5	21 58 59.50	-13 8 17.2	0.5	1.7	0.12	20	11 58	21 52 48.51	-13 41 50.1	0.5	1.8	0.12
6	15 1	21 58 53.69	13 8 50.2	0.5	1.7	0.12	21	11 54	21 52 39.28	13 42 38.5	0.5	1.8	0.12
7	14 57	21 58 47.73	13 9 24.0	0.5	1.7	0.12	22	11 50	21 52 30.06	13 43 26.8	0.5	1.8	0.12
8	14 53	21 58 41.64	13 9 58.4	0.5	1.7	0.12	23	11 46	21 52 20.84	13 44 15.0	0.5	1.8	0.12
9	14 49	21 58 35.41	13 10 33.5	0.5	1.7	0.12	24	11 42	21 52 11.64	13 45 2.9	0.5	1.8	0.12
10	14 45	21 58 29.04	-13 11 9.3	0.5	1.7	0.12	25	11 37	21 52 2.46	-13 45 50.8	0.5	1.8	0.12
11	14 41	21 58 22.54	13 11 45.7	0.5	1.7	0.12	26	11 33	21 51 53.30	13 46 38.5	0.5	1.8	0.12
12	14 37	21 58 15.91	13 12 22.8	0.5	1.8	0.12	27	11 29	21 51 44.17	13 47 26.0	0.5	1.8	0.12
13	14 33	21 58 9.16	13 13 0.5	0.5	1.8	0.12	28	11 25	21 51 35.07	13 48 13.3	0.5	1.8	0.12
14	14 29	21 58 2.28	13 13 38.8	0.5	1.8	0.12	29	11 21	21 51 25.99	13 49 0.3	0.5	1.8	0.12
15	14 25	21 57 55.27	-13 14 17.8	0.5	1.8	0.12	30	11 17	21 51 16.96	-13 49 47.0	0.5	1.8	0.12
16	14 21	21 57 48.16	13 14 57.3	0.5	1.8	0.12	31	11 13	21 51 7.97	13 50 33.4	0.5	1.8	0.12
17	14 17	21 57 40.94	13 15 37.4	0.5	1.8	0.12	Sept. 1	11 9	21 50 59.02	13 51 19.6	0.5	1.8	0.12
18	14 13	21 57 33.59	13 16 18.0	0.5	1.8	0.12	2	11 5	21 50 50.12	13 52 5.3	0.5	1.8	0.12
19	14 8	21 57 26.12	13 16 59.1	0.5	1.8	0.12	3	11 1	21 50 41.28	13 52 50.7	0.5	1.8	0.12
20	14 4	21 57 18.56	-13 17 40.8	0.5	1.8	0.12	4	10 57	21 50 32.48	-13 53 35.8	0.5	1.8	0.12
21	14 0	21 57 10.90	13 18 22.9	0.5	1.8	0.12	5	10 53	21 50 23.76	13 54 20.5	0.5	1.8	0.12
22	13 56	21 57 3.14	13 19 5.5	0.5	1.8	0.12	6	10 49	21 50 15.09	13 55 4.9	0.5	1.8	0.12
23	13 52	21 56 55.28	13 19 48.6	0.5	1.8	0.12	7	10 45	21 50 6.51	13 55 48.8	0.5	1.8	0.12
24	13 48	21 56 47.32	13 20 32.2	0.5	1.8	0.12	8	10 41	21 49 57.98	13 56 32.3	0.5	1.8	0.12
25	13 44	21 56 39.28	-13 21 16.2	0.5	1.8	0.12	9	10 36	21 49 49.54	-13 57 15.3	0.5	1.8	0.12
26	13 40	21 56 31.13	-13 22 0.6	0.5	1.8	0.12	10	10 32	21 49 41.17	-13 57 57.8	0.5	1.8	0.12

Stellar magnitude at opposition in August, 1918, 6.0.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
pt. 10	10 32	21 49 41.17	-13 57 57.8	0.5	1.8	0.12	Oct. 26	7 27	21 45 34.34	-14 17 51.6	0.5	1.7	0.12
11	10 28	21 49 32.88	13 58 39.7	0.5	1.8	0.12	27	7 23	21 45 32.87	14 17 56.9	0.5	1.7	0.12
12	10 24	21 49 24.69	13 59 21.2	0.5	1.8	0.12	28	7 19	21 45 31.59	14 18 1.2	0.5	1.7	0.12
13	10 20	21 49 16.59	14 0 2.2	0.5	1.8	0.12	29	7 15	21 45 30.51	14 18 4.5	0.5	1.7	0.12
14	10 16	21 49 8.57	14 0 42.7	0.5	1.8	0.12	30	7 12	21 45 29.63	14 18 6.8	0.5	1.7	0.12
15	10 12	21 49 0.66	-14 1 22.5	0.5	1.8	0.12	31	7 8	21 45 28.94	-14 18 8.1	0.5	1.7	0.12
16	10 8	21 48 52.85	14 2 1.8	0.5	1.8	0.12	Nov. 1	7 4	21 45 28.44	14 18 8.4	0.5	1.7	0.12
17	10 4	21 48 45.13	14 2 40.5	0.5	1.8	0.12	2	7 0	21 45 28.14	14 18 7.7	0.5	1.7	0.12
18	10 0	21 48 37.53	14 3 18.6	0.5	1.8	0.12	3	6 56	21 45 28.04	14 18 5.9	0.4	1.7	0.12
19	9 56	21 48 30.03	14 3 56.1	0.5	1.8	0.12	4	6 52	21 45 28.14	14 18 3.1	0.4	1.7	0.12
20	9 52	21 48 22.65	-14 4 32.9	0.5	1.8	0.12	5	6 48	21 45 28.44	-14 17 59.3	0.4	1.7	0.12
21	9 48	21 48 15.37	14 5 9.2	0.5	1.8	0.12	6	6 44	21 45 28.93	14 17 54.5	0.4	1.7	0.12
22	9 44	21 48 8.22	14 5 44.7	0.5	1.8	0.12	7	6 40	21 45 29.63	14 17 48.7	0.4	1.7	0.12
23	9 40	21 48 1.19	14 6 19.6	0.5	1.8	0.12	8	6 36	21 45 30.53	14 17 41.8	0.4	1.7	0.12
24	9 35	21 47 54.28	14 6 53.7	0.5	1.8	0.12	9	6 32	21 45 31.62	14 17 33.8	0.4	1.7	0.12
25	9 31	21 47 47.50	-14 7 27.2	0.5	1.7	0.12	10	6 28	21 45 32.91	-14 17 25.0	0.4	1.7	0.12
26	9 27	21 47 40.86	14 8 0.0	0.5	1.7	0.12	11	6 24	21 45 34.40	14 17 15.1	0.4	1.7	0.12
27	9 23	21 47 34.34	14 8 32.0	0.5	1.7	0.12	12	6 20	21 45 36.09	14 17 4.2	0.4	1.7	0.12
28	9 19	21 47 27.96	14 9 3.3	0.5	1.7	0.12	13	6 17	21 45 37.98	14 16 52.3	0.4	1.7	0.12
29	9 15	21 47 21.72	14 9 33.8	0.5	1.7	0.12	14	6 13	21 45 40.06	14 16 39.4	0.4	1.7	0.12
30	9 11	21 47 15.61	-14 10 3.6	0.5	1.7	0.12	15	6 9	21 45 42.34	-14 16 25.4	0.4	1.7	0.12
1. 1	9 7	21 47 9.65	14 10 32.6	0.5	1.7	0.12	16	6 5	21 45 44.82	14 16 10.4	0.4	1.7	0.12
2	9 3	21 47 3.84	14 11 0.7	0.5	1.7	0.12	17	6 1	21 45 47.50	14 15 54.4	0.4	1.7	0.11
3	8 59	21 46 58.17	14 11 28.1	0.5	1.7	0.12	18	5 57	21 45 50.36	14 15 37.5	0.4	1.7	0.11
4	8 55	21 46 52.66	14 11 54.7	0.5	1.7	0.12	19	5 53	21 45 53.43	14 15 19.6	0.4	1.7	0.11
5	8 51	21 46 47.31	-14 12 20.4	0.5	1.7	0.12	20	5 49	21 45 56.69	-14 15 0.7	0.4	1.7	0.11
6	8 47	21 46 42.11	14 12 45.2	0.5	1.7	0.12	21	5 46	21 46 0.14	14 14 40.7	0.4	1.7	0.11
7	8 43	21 46 37.08	14 13 9.2	0.5	1.7	0.12	22	5 42	21 46 3.80	14 14 19.9	0.4	1.7	0.11
8	8 39	21 46 32.21	14 13 32.3	0.5	1.7	0.12	23	5 38	21 46 7.64	14 13 58.0	0.4	1.7	0.11
9	8 35	21 46 27.50	14 13 54.6	0.5	1.7	0.12	24	5 34	21 46 11.67	14 13 35.1	0.4	1.7	0.11
10	8 31	21 46 22.96	-14 14 15.9	0.5	1.7	0.12	25	5 30	21 46 15.90	-14 13 11.2	0.4	1.7	0.11
11	8 27	21 46 18.59	14 14 36.5	0.5	1.7	0.12	26	5 26	21 46 20.31	14 12 46.4	0.4	1.7	0.11
12	8 23	21 46 14.39	14 14 56.0	0.5	1.7	0.12	27	5 22	21 46 24.92	14 12 20.6	0.4	1.7	0.11
13	8 19	21 46 10.35	14 15 14.7	0.5	1.7	0.12	28	5 18	21 46 29.72	14 11 53.8	0.4	1.7	0.11
14	8 15	21 46 6.50	14 15 32.4	0.5	1.7	0.12	29	5 15	21 46 34.71	14 11 26.1	0.4	1.7	0.11
15	8 11	21 46 2.83	-14 15 49.2	0.5	1.7	0.12	30	5 11	21 46 39.88	-14 10 57.4	0.4	1.7	0.11
16	8 7	21 45 59.33	14 16 5.1	0.5	1.7	0.12	Dec. 1	5 7	21 46 45.24	14 10 27.7	0.4	1.7	0.11
17	8 3	21 45 56.00	14 16 20.0	0.5	1.7	0.12	2	5 3	21 46 50.79	14 9 57.1	0.4	1.7	0.11
18	7 59	21 45 52.86	14 16 34.1	0.5	1.7	0.12	3	4 59	21 46 56.52	14 9 25.6	0.4	1.6	0.11
19	7 55	21 45 49.89	14 16 47.2	0.5	1.7	0.12	4	4 55	21 47 2.43	14 8 53.1	0.4	1.6	0.11
20	7 51	21 45 47.11	-14 16 59.3	0.5	1.7	0.12	5	4 51	21 47 8.52	-14 8 19.7	0.4	1.6	0.11
21	7 47	21 45 44.52	14 17 10.4	0.5	1.7	0.12	6	4 48	21 47 14.79	14 7 45.4	0.4	1.6	0.11
22	7 43	21 45 42.11	14 17 20.6	0.5	1.7	0.12	7	4 44	21 47 21.24	14 7 10.2	0.4	1.6	0.11
23	7 39	21 45 39.88	14 17 29.8	0.5	1.7	0.12	8	4 40	21 47 27.86	14 6 34.1	0.4	1.6	0.11
24	7 35	21 45 37.84	14 17 38.1	0.5	1.7	0.12	9	4 36	21 47 34.67	14 5 57.1	0.4	1.6	0.11
25	7 31	21 45 35.99	-14 17 45.3	0.5	1.7	0.12	10	4 32	21 47 41.65	-14 5 19.2	0.4	1.6	0.11
26	7 27	21 45 34.34	-14 17 51.6	0.5	1.7	0.12	11	4 29	21 47 48.79	-14 4 40.5	0.4	1.6	0.11

Stellar magnitude at opposition in August, 1918, 6.0.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	S. T. of Sem. Trans. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	S. T. of Sem. Trans. Mer.
Jan. 0	h m	h m s	" " "	"	"	s	Feb. 15	h m	h m s	" " "	"	"	s
1	13 54	8 34 58.58	+18 31 0.0	0.3	1.3	0.09	16	10 49	8 29 53.12	+18 49 51.7	0.3	1.3	0.09
2	13 50	8 34 52.56	18 31 22.6	0.3	1.3	0.09	17	10 45	8 29 46.83	18 50 14.9	0.3	1.3	0.09
3	13 46	8 34 46.47	18 31 45.4	0.3	1.3	0.09	18	10 40	8 29 40.60	18 50 37.8	0.3	1.3	0.09
4	13 42	8 34 40.32	18 32 8.4	0.3	1.3	0.09	19	10 36	8 29 34.43	18 51 0.4	0.3	1.3	0.09
5	13 38	8 34 34.10	18 32 31.7	0.3	1.3	0.09	20	10 32	8 29 28.32	18 51 22.9	0.3	1.3	0.09
6	13 34	8 34 27.82	+18 32 55.1	0.3	1.3	0.09	21	10 28	8 29 22.27	+18 51 45.1	0.3	1.3	0.09
7	13 30	8 34 21.49	18 33 18.8	0.3	1.3	0.09	22	10 24	8 29 16.29	18 52 7.1	0.3	1.3	0.09
8	13 26	8 34 15.11	18 33 42.6	0.3	1.3	0.09	23	10 20	8 29 10.38	18 52 28.8	0.3	1.3	0.09
9	13 22	8 34 8.67	18 34 6.6	0.3	1.3	0.09	24	10 16	8 29 4.55	18 52 50.3	0.3	1.3	0.09
10	13 18	8 34 2.19	18 34 30.8	0.3	1.3	0.09	25	10 12	8 28 58.79	18 53 11.4	0.3	1.3	0.09
11	13 14	8 33 55.66	+18 34 55.1	0.3	1.3	0.09	26	10 8	8 28 53.11	+18 53 32.4	0.3	1.3	0.09
12	13 10	8 33 49.08	18 35 19.7	0.3	1.3	0.09	27	10 4	8 28 47.51	18 53 53.0	0.3	1.3	0.09
13	13 6	8 33 42.46	18 35 44.3	0.3	1.3	0.09	28	9 56	8 28 41.98	18 54 13.2	0.3	1.3	0.09
14	13 2	8 33 35.80	18 36 9.1	0.3	1.3	0.09	1	9 52	8 28 36.54	18 54 33.2	0.3	1.3	0.09
15	12 58	8 33 29.12	18 36 33.9	0.3	1.3	0.09	2	9 52	8 28 31.19	18 54 52.9	0.3	1.3	0.09
16	12 54	8 33 22.39	+18 36 59.0	0.3	1.3	0.09	3	9 48	8 28 25.93	+18 55 12.3	0.3	1.3	0.09
17	12 50	8 33 15.63	18 37 24.1	0.3	1.3	0.09	4	9 44	8 28 20.75	18 55 31.4	0.3	1.3	0.09
18	12 46	8 33 8.86	18 37 49.3	0.3	1.3	0.09	5	9 40	8 28 15.67	18 55 50.2	0.3	1.3	0.09
19	12 42	8 33 2.05	18 38 14.5	0.3	1.3	0.09	6	9 36	8 28 10.67	18 56 8.6	0.3	1.3	0.09
20	12 38	8 32 55.22	18 38 39.9	0.3	1.3	0.09	7	9 32	8 28 5.77	18 56 26.7	0.3	1.3	0.09
21	12 34	8 32 48.38	+18 39 5.2	0.3	1.3	0.09	8	9 28	8 28 0.97	+18 56 44.5	0.3	1.3	0.09
22	12 30	8 32 41.52	18 39 30.6	0.3	1.3	0.09	9	9 24	8 27 56.26	18 57 1.9	0.3	1.3	0.09
23	12 26	8 32 34.66	18 39 56.1	0.3	1.3	0.09	10	9 20	8 27 51.66	18 57 18.9	0.3	1.3	0.09
24	12 22	8 32 27.78	18 40 21.6	0.3	1.3	0.09	11	9 16	8 27 47.16	18 57 35.5	0.3	1.3	0.09
25	12 18	8 32 20.89	18 40 47.1	0.3	1.3	0.09	12	9 12	8 27 42.76	18 57 51.9	0.3	1.3	0.09
26	12 13	8 32 14.00	+18 41 12.6	0.3	1.3	0.09	13	9 8	8 27 38.47	+18 58 7.8	0.3	1.3	0.09
27	12 9	8 32 7.11	18 41 38.0	0.3	1.3	0.09	14	9 4	8 27 34.30	18 58 23.2	0.3	1.3	0.09
28	12 5	8 32 0.22	18 42 3.5	0.3	1.3	0.09	15	9 0	8 27 30.23	18 58 38.4	0.3	1.3	0.09
29	12 1	8 31 53.33	18 42 28.9	0.3	1.3	0.09	16	8 56	8 27 26.27	18 58 53.1	0.3	1.3	0.09
30	11 57	8 31 46.45	18 42 54.4	0.3	1.3	0.09	17	8 52	8 27 22.43	18 59 7.4	0.3	1.3	0.09
31	11 53	8 31 39.58	+18 43 19.7	0.3	1.3	0.09	18	8 48	8 27 18.71	+18 59 21.4	0.3	1.3	0.09
Feb. 1	11 49	8 31 32.72	18 43 45.0	0.3	1.3	0.09	19	8 44	8 27 15.10	18 59 35.0	0.3	1.3	0.09
2	11 45	8 31 25.88	18 44 10.3	0.3	1.3	0.09	20	8 40	8 27 11.61	18 59 48.2	0.3	1.3	0.09
3	11 41	8 31 19.05	18 44 35.5	0.3	1.3	0.09	21	8 36	8 27 8.23	19 0 0.8	0.3	1.3	0.09
4	11 37	8 31 12.23	18 45 0.6	0.3	1.3	0.09	22	8 32	8 27 4.96	19 0 13.1	0.3	1.3	0.09
5	11 33	8 31 5.45	+18 45 25.7	0.3	1.3	0.09	23	8 28	8 27 1.83	+19 0 25.0	0.3	1.3	0.09
6	11 29	8 30 58.70	18 45 50.5	0.3	1.3	0.09	24	8 24	8 26 58.81	19 0 36.5	0.3	1.3	0.09
7	11 25	8 30 51.96	18 46 15.4	0.3	1.3	0.09	25	8 20	8 26 55.92	19 0 47.4	0.3	1.3	0.09
8	11 21	8 30 45.27	18 46 40.1	0.3	1.3	0.09	26	8 16	8 26 53.16	19 0 58.0	0.3	1.3	0.09
9	11 17	8 30 38.61	18 47 4.5	0.3	1.3	0.09	27	8 12	8 26 50.52	19 1 8.1	0.3	1.3	0.09
10	11 13	8 30 31.97	+18 47 28.9	0.3	1.3	0.09	28	8 8	8 26 48.00	+19 1 17.8	0.3	1.3	0.09
11	11 9	8 30 25.38	18 47 53.2	0.3	1.3	0.09	29	8 4	8 26 45.61	19 1 27.1	0.3	1.3	0.09
12	11 5	8 30 18.84	18 48 17.2	0.3	1.3	0.09	30	8 0	8 26 43.36	19 1 36.0	0.3	1.3	0.09
13	11 1	8 30 12.33	18 48 41.1	0.3	1.3	0.09	31	7 56	8 26 41.22	19 1 44.4	0.3	1.3	0.09
14	10 57	8 30 5.88	18 49 4.9	0.3	1.3	0.09	1	7 52	8 26 39.21	19 1 52.3	0.3	1.3	0.09
15	10 53	8 29 59.47	+18 49 28.4	0.3	1.3	0.09	2	7 48	8 26 37.34	+19 1 59.8	0.3	1.3	0.09
16	10 49	8 29 53.12	+18 49 51.7	0.3	1.3	0.09	3	7 44	8 26 35.59	+19 2 6.8	0.3	1.3	0.09

Stellar magnitude at opposition in January, 1918, 7.7.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	7 48	8 26 37.34	+19 1 59.8	0.3	1.3	0.09	Nov. 15	17 8	8 46 56.08	+17 49 34.5	0.3	1.3	0.09
2	7 44	8 26 35.59	19 2 6.8	0.3	1.3	0.09	16	17 4	8 46 55.47	17 49 37.4	0.3	1.3	0.09
3	7 40	8 26 33.97	19 2 13.4	0.3	1.3	0.09	17	17 0	8 46 54.72	17 49 40.8	0.3	1.3	0.09
4	7 36	8 26 32.48	19 2 19.5	0.3	1.3	0.09	18	16 56	8 46 53.83	17 49 44.8	0.3	1.3	0.09
5	7 32	8 26 31.13	19 2 25.2	0.3	1.3	0.09	19	16 52	8 46 52.81	17 49 49.2	0.3	1.3	0.09
6	7 29	8 26 29.91	+19 2 30.4	0.3	1.3	0.09	20	16 48	8 46 51.66	+17 49 54.2	0.3	1.3	0.09
7	7 25	8 26 28.83	19 2 35.1	0.3	1.3	0.09	21	16 45	8 46 50.37	17 49 59.7	0.3	1.3	0.09
8	7 21	8 26 27.89	19 2 39.3	0.3	1.3	0.09	22	16 41	8 46 48.95	17 50 5.7	0.3	1.3	0.09
9	7 17	8 26 27.09	19 2 43.1	0.3	1.3	0.09	23	16 37	8 46 47.39	17 50 12.3	0.3	1.3	0.09
10	7 13	8 26 26.41	19 2 46.4	0.3	1.3	0.09	24	16 33	8 46 45.70	17 50 19.4	0.3	1.3	0.09
11	7 9	8 26 25.87	+19 2 49.2	0.3	1.3	0.09	25	16 29	8 46 43.88	+17 50 27.0	0.3	1.3	0.09
12	7 5	8 26 25.47	19 2 51.6	0.3	1.3	0.09	26	16 25	8 46 41.92	17 50 35.1	0.3	1.3	0.09
13	7 1	8 26 25.21	19 2 53.5	0.3	1.3	0.09	27	16 21	8 46 39.84	17 50 43.7	0.3	1.3	0.09
14	6 57	8 26 25.08	19 2 54.9	0.3	1.3	0.09	28	16 17	8 46 37.63	17 50 52.9	0.3	1.3	0.09
15	6 53	8 26 25.09	19 2 55.9	0.3	1.3	0.09	29	16 13	8 46 35.28	17 51 2.6	0.3	1.3	0.09
16	6 49	8 26 25.23	+19 2 56.3	0.3	1.3	0.09	30	16 9	8 46 32.80	+17 51 12.8	0.3	1.3	0.09
17	6 45	8 26 25.51	19 2 56.3	0.3	1.3	0.09	Dec. 1	16 5	8 46 30.20	17 51 23.5	0.3	1.3	0.09
18	6 41	8 26 25.93	19 2 55.9	0.3	1.3	0.09	2	16 1	8 46 27.47	17 51 34.7	0.3	1.3	0.09
19	6 37	8 26 26.48	19 2 54.9	0.3	1.3	0.09	3	15 57	8 46 24.61	17 51 46.3	0.3	1.3	0.09
20	6 33	8 26 27.18	19 2 53.5	0.3	1.3	0.09	4	15 53	8 46 21.62	17 51 58.5	0.3	1.3	0.09
21	6 30	8 26 28.00	+19 2 51.6	0.3	1.3	0.09	5	15 49	8 46 18.51	+17 52 11.2	0.3	1.3	0.09
22	6 26	8 26 28.97	19 2 49.3	0.3	1.3	0.09	6	15 45	8 46 15.28	17 52 24.3	0.3	1.3	0.09
....	....	....	....	....	....	....	7	15 41	8 46 11.93	17 52 37.9	0.3	1.3	0.09
....	....	....	....	....	....	....	8	15 37	8 46 8.47	17 52 51.9	0.3	1.3	0.09
Oct. 24	18 34	8 46 34.71	+17 50 48.5	0.3	1.3	0.09	9	15 33	8 46 4.88	17 53 6.4	0.3	1.3	0.09
25	18 30	8 46 37.12	+17 50 39.5	0.3	1.3	0.09	10	15 29	8 46 1.18	+17 53 21.4	0.3	1.3	0.09
26	18 27	8 46 39.39	17 50 31.0	0.3	1.3	0.09	11	15 25	8 45 57.37	17 53 36.8	0.3	1.3	0.09
27	18 23	8 46 41.53	17 50 23.1	0.3	1.3	0.09	12	15 21	8 45 53.44	17 53 52.6	0.3	1.3	0.09
28	18 19	8 46 43.54	17 50 15.7	0.3	1.3	0.09	13	15 17	8 45 49.40	17 54 8.9	0.3	1.3	0.09
29	18 15	8 46 45.40	17 50 8.8	0.3	1.3	0.09	14	15 13	8 45 45.25	17 54 25.6	0.3	1.3	0.09
30	18 11	8 46 47.13	+17 50 2.4	0.3	1.3	0.09	15	15 9	8 45 41.00	+17 54 42.7	0.3	1.3	0.09
31	18 7	8 46 48.73	17 49 56.6	0.3	1.3	0.09	16	15 5	8 45 36.64	17 55 0.2	0.3	1.3	0.09
Nov. 1	18 3	8 46 50.18	17 49 51.4	0.3	1.3	0.09	17	15 1	8 45 32.17	17 55 18.2	0.3	1.3	0.09
2	17 59	8 46 51.50	17 49 46.7	0.3	1.3	0.09	18	14 57	8 45 27.60	17 55 36.5	0.3	1.3	0.09
3	17 55	8 46 52.69	17 49 42.5	0.3	1.3	0.09	19	14 53	8 45 22.93	17 55 55.3	0.3	1.3	0.09
4	17 51	8 46 53.73	+17 49 38.8	0.3	1.3	0.09	20	14 49	8 45 18.16	+17 56 14.4	0.3	1.3	0.09
5	17 48	8 46 54.63	17 49 35.7	0.3	1.3	0.09	21	14 45	8 45 13.29	17 56 33.9	0.3	1.3	0.09
6	17 44	8 46 55.40	17 49 33.2	0.3	1.3	0.09	22	14 41	8 45 8.32	17 56 53.7	0.3	1.3	0.09
7	17 40	8 46 56.02	17 49 31.2	0.3	1.3	0.09	23	14 37	8 45 3.27	17 57 14.0	0.3	1.3	0.09
8	17 36	8 46 56.51	17 49 29.7	0.3	1.3	0.09	24	14 33	8 44 58.12	17 57 34.6	0.3	1.3	0.09
9	17 32	8 46 56.86	+17 49 28.7	0.3	1.3	0.09	25	14 29	8 44 52.87	+17 57 55.5	0.3	1.3	0.09
10	17 28	8 46 57.08	17 49 28.3	0.3	1.3	0.09	26	14 25	8 44 47.54	17 58 16.6	0.3	1.3	0.09
11	17 24	8 46 57.15	17 49 28.5	0.3	1.3	0.09	27	14 21	8 44 42.12	17 58 38.2	0.3	1.3	0.09
12	17 20	8 46 57.09	17 49 29.1	0.3	1.3	0.09	28	14 17	8 44 36.62	17 59 0.1	0.3	1.3	0.09
13	17 16	8 46 56.89	17 49 30.4	0.3	1.3	0.09	29	14 13	8 44 31.04	17 59 22.2	0.3	1.3	0.09
14	17 12	8 46 56.55	+17 49 32.2	0.3	1.3	0.09	30	14 9	8 44 25.38	+17 59 44.7	0.3	1.3	0.09
15	17 8	8 46 56.08	+17 49 34.5	0.3	1.3	0.09	31	14 5	8 44 19.64	+18 0 7.5	0.3	1.3	0.09

Stellar magnitude at opposition in January, 1918, 7.7.

PART III.

PHENOMENA.

In the year 1918 there will be three eclipses, two of the Sun and one of the Moon.

I.—*A Total Eclipse of the Sun*, 1918, June 8, visible at Washington as a partial eclipse.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, June				d	h	m	s
				8	10	7	24.2
Sun and Moon's R. A.	h	m	s	Hourly motions			
	5	4	39.98	10.33 and 152.10			
Sun's declination	+22	50	23.8	Hourly motion			
Moon's declination	+23	17	39.1	+ 0 13.6			
Sun's equa. hor. parallax	8.7			Hourly motion			
Moon's equa. hor. parallax	58	39.4		+ 0 7.4			
				Sun's true semidiameter			
				15 45.3			
				Moon's true semidiameter			
				15 58.2			

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.			Longitude from Greenwich.		Latitude.
	d	h	m			
Eclipse begins	June	8	7 29.0	-150	20	+16 22
Central eclipse begins		8	8 32.2	-129	58	+25 41
Central eclipse at local apparent noon		8	10 7.4	+152	10	+50 51
Central eclipse ends		8	11 42.9	+ 74	31	+25 23
Eclipse ends		8	12 46.2	+ 94	53	+16 3

II.—*A Partial Eclipse of the Moon*, 1918, June 23–24, partly visible at Washington, the Moon setting eclipsed; the beginning visible generally in South America except the eastern portion, North America except the northern portion, throughout the Pacific Ocean and Australia; the ending visible generally in southwestern North America, western and southern South America, throughout the Pacific Ocean and Australia.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, June				d	h	m	s
				23	22	39	44.2
Sun's right ascension	h	m	s	Hourly motion			
	6	9	7.39	10.39			
Moon's right ascension	18	9	7.39	Hourly motion			
				143.63			
Sun's declination	+23	25	58.1	Hourly motion			
Moon's declination	-22	31	46.4	- 0 2.3			
Sun's equa. hor. parallax	8.7			Hourly motion			
Moon's equa. hor. parallax	57	18.4		+ 3 32.7			
				Sun's true semidiameter			
				15 44.1			
				Moon's true semidiameter			
				15 36.2			

CIRCUMSTANCES OF THE ECLIPSE.

	June	d	h	m	
		23	20	8.7	
Moon enters penumbra		23	21	46.4	} Greenwich Mean Time.
Moon enters umbra		23	22	28.0	
Middle of the eclipse		23	23	9.8	
Moon leaves umbra		24	0	47.1	
Moon leaves penumbra					

Contacts of Umbra
with Moon's Limb.

Angles of Position
from the North Point.

The Moon being in the Zenith
in Longitude
from Greenwich, and in latitude.

First	152 to E.	+146	36	-22	35
Last	165 to W.	+166	40	-22	30

Magnitude of the eclipse=0.135 (Moon's diameter=1.0).

III.—*An Annular Eclipse of the Sun*, 1918, December 3, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ϕ in right ascension, December 3				d	h	m	s
				3	22	59.9	
Sun and Moon's R. A.	h	m	s	Hourly motions			
	16	36	17.31	10.84 and 133.04			
	°	'	"				
Sun's declination	-22	3	17.5	Hourly motion			
				-0 21.6			
Moon's declination	-22	16	25.0	Hourly motion			
				-1 33.1			
Sun's equa. hor. parallax	8.9			Sun's true semidiameter			
				16 13.6			
Moon's equa. hor. parallax	55	3.2		Moon's true semidiameter			
				14 59.3			

CIRCUMSTANCES OF THE ECLIPSE.

	December	Greenwich Mean Time.			Longitude from Greenwich.		Latitude.	
		d	h	m	°	'	°	'
Eclipse begins		3	0	21.3	+100	17	- 5	52
Central eclipse begins		3	1	23.8	+119	7	-10	36
Central eclipse at local apparent noon		3	3	23.0	+ 53	19	-36	5
Central eclipse ends		3	5	14.9	- 14	59	-15	4
Eclipse ends		3	6	22.3	+ 3	53	-10	21

The regions within which the eclipses of the Sun are visible are laid down the accompanying charts, from which, by means of the dotted lines, the Greenwich mean times of beginning and ending at any place may be found with an uncertainty which will vary from three or four minutes for a high sun to fifteen or twenty minutes when the Sun is near the horizon.

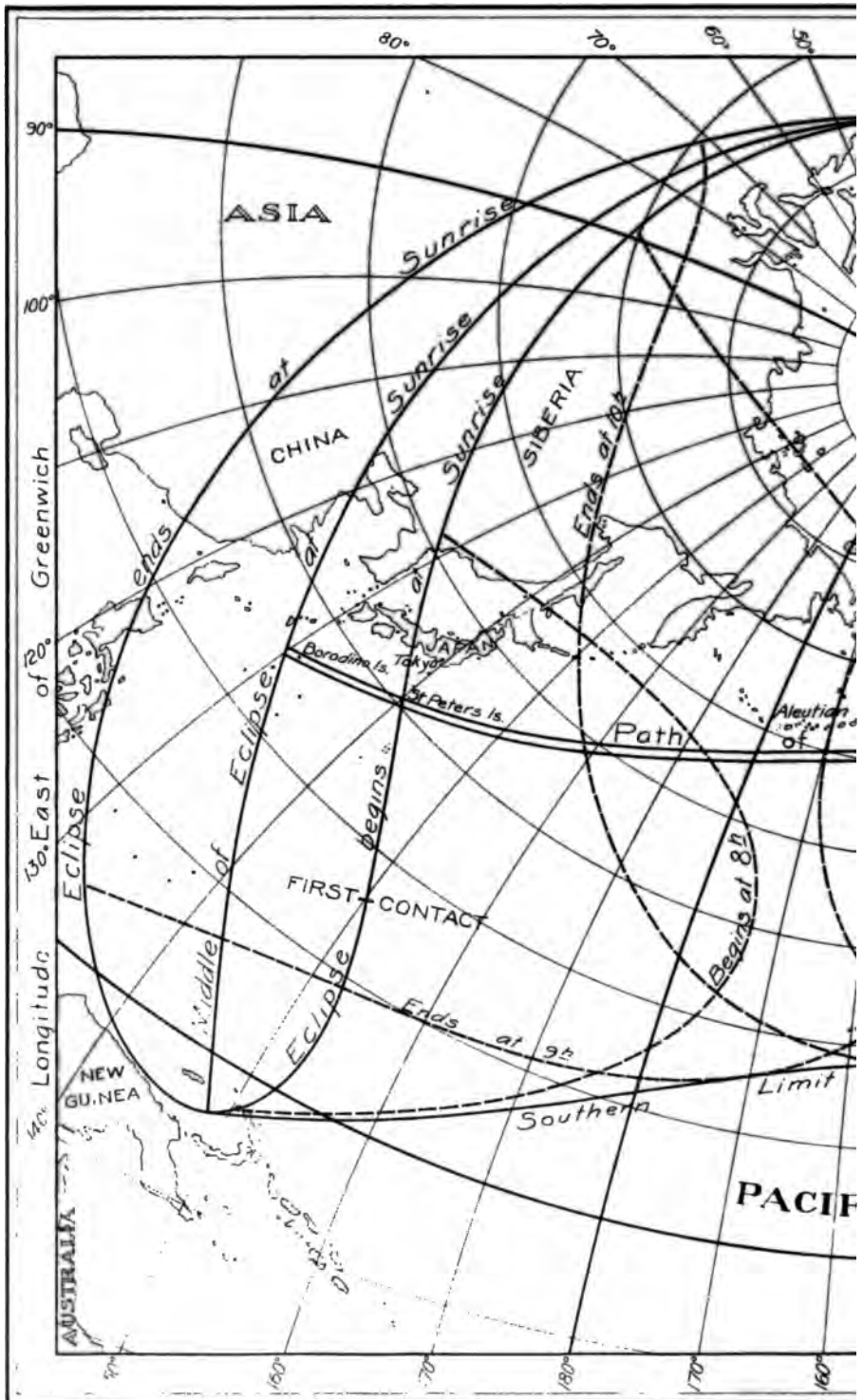
BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN, 1918, JUNE 8.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Umbra on Fundamental Plane.	
	x	y	Log $\sin d$	Log $\cos d$	μ	l_1	l_2
h m							
7 20	-1.55216	+0.46880	+9.58880	+9.96458	110 18.6	+0.54179	-0.00410
30	1.45946	0.46870	9.58881	9.96457	112 48.6	0.54182	0.00407
40	1.36674	0.46860	9.58882	9.96457	115 18.6	0.54185	0.00404
50	1.27403	0.46848	9.58883	9.96457	117 48.5	0.54188	0.00402
8 0	-1.18132	+0.46835	+9.58884	+9.96457	120 18.5	+0.54191	-0.00399
10	1.08860	0.46821	9.58885	9.96457	122 48.5	0.54193	0.00396
20	0.99588	0.46806	9.58887	9.96456	125 18.5	0.54196	0.00394
30	0.90316	0.46790	9.58888	9.96456	127 48.5	0.54199	0.00391
40	0.81044	0.46773	9.58889	9.96456	130 18.5	0.54201	0.00389
50	0.71772	0.46755	9.58890	9.96456	132 48.5	0.54203	0.00386
9 0	-0.62499	+0.46736	+9.58891	+9.96456	135 18.5	+0.54206	-0.00384
10	0.53227	0.46716	9.58892	9.96455	137 48.5	0.54208	0.00382
20	0.43954	0.46695	9.58893	9.96455	140 18.5	0.54210	0.00379
30	0.34682	0.46673	9.58895	9.96455	142 48.5	0.54213	0.00377
40	0.25409	0.46650	9.58896	9.96455	145 18.5	0.54215	0.00375
50	0.16137	0.46626	9.58897	9.96455	147 48.5	0.54217	0.00373
10 0	-0.06864	+0.46601	+9.58898	+9.96454	150 18.5	+0.54219	-0.00371
10	+0.02408	0.46574	9.58899	9.96454	152 48.5	0.54220	0.00369
20	0.11680	0.46547	9.58900	9.96454	155 18.5	0.54222	0.00368
30	0.20952	0.46519	9.58901	9.96454	157 48.5	0.54224	0.00366
40	0.30224	0.46489	9.58903	9.96454	160 18.5	0.54226	0.00364
50	0.39496	0.46459	9.58904	9.96453	162 48.5	0.54227	0.00362
11 0	+0.48768	+0.46428	+9.58905	+9.96453	165 18.4	+0.54229	-0.00361
10	0.58039	0.46395	9.58906	9.96453	167 48.4	0.54230	0.00359
20	0.67310	0.46362	9.58907	9.96453	170 18.4	0.54232	0.00358
30	0.76581	0.46327	9.58908	9.96453	172 48.4	0.54233	0.00357
40	0.85852	0.46292	9.58909	9.96452	175 18.4	0.54235	0.00355
50	0.95122	0.46255	9.58911	9.96452	177 48.4	0.54236	0.00354
12 0	+1.04392	+0.46217	+9.58912	+9.96452	180 18.4	+0.54237	-0.00353
10	1.13662	0.46179	9.58913	9.96452	182 48.4	0.54238	0.00352
20	1.22931	0.46139	9.58914	9.96452	185 18.4	0.54239	0.00351
30	1.32200	0.46098	9.58915	9.96451	187 48.4	0.54240	0.00350
40	1.41469	0.46056	9.58916	9.96451	190 18.4	0.54241	0.00349
50	+1.50737	+0.46014	+9.58917	+9.96451	192 48.4	+0.54242	-0.00348

Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Umbra.
h m					
7 0	+7.9671	-4.8591	+1.1761	+7.66329	+7.66112
8 0	7.9672	5.1261	1.1761	7.66329	7.66112
9 0	7.9672	5.2907	1.1761	7.66328	7.66112
10 0	7.9672	5.4103	1.1761	7.66328	7.66111
11 0	7.9672	5.5041	1.1761	7.66328	7.66111
12 0	7.9671	5.5813	1.1761	7.66328	7.66111
13 0	+7.9670	-5.6472	+1.1761	+7.66328	+7.66111

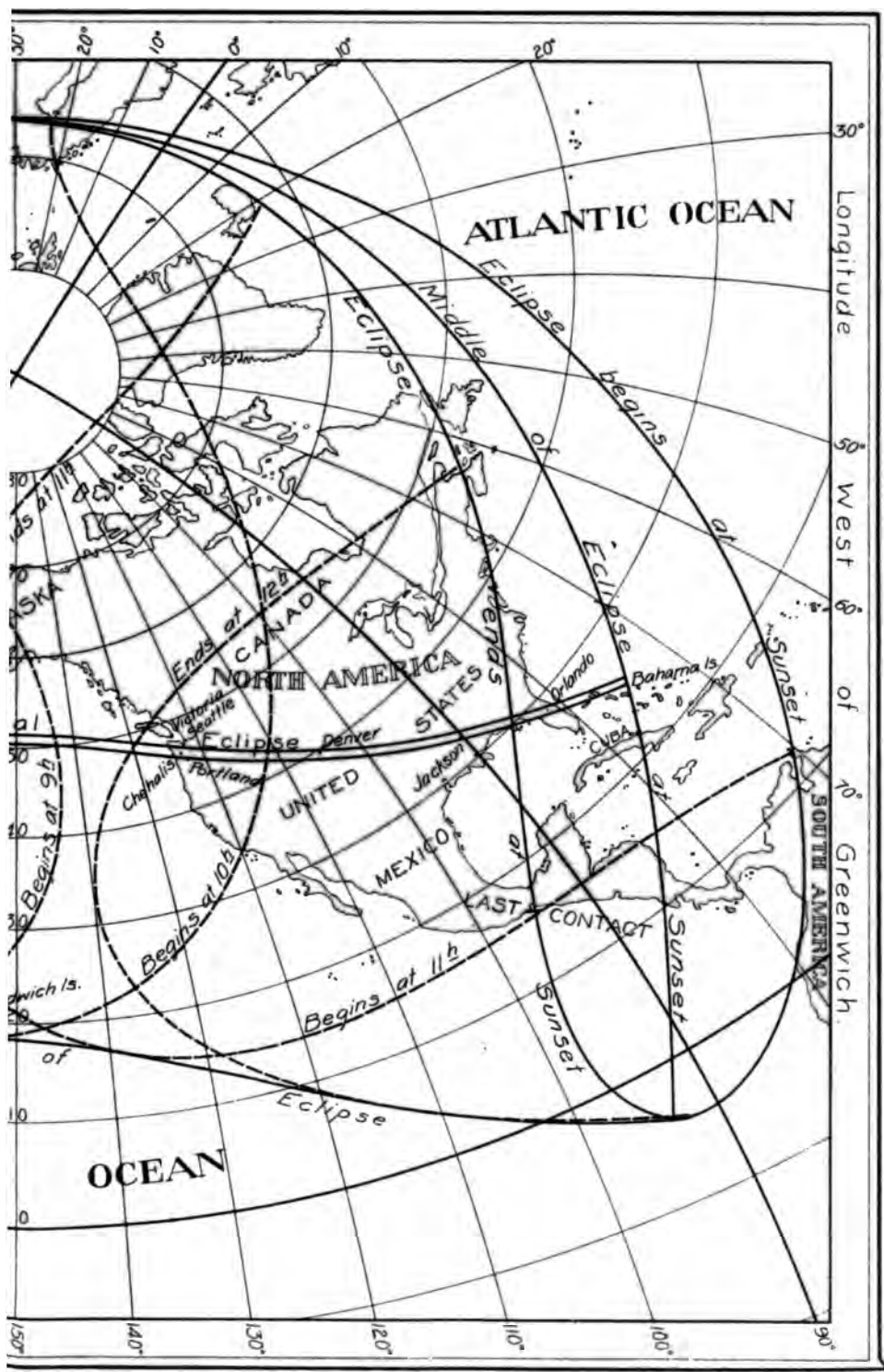


TOTAL ECLIPSE



Note - The hours of beginning and end

F JUNE 8TH 1918.



Time expressed in Greenwich Mean Time.

PATH OF TOTAL PHASE DURING THE ECLIPSE OF THE SUN,
1918, JUNE 8.

Green- wich Mean Time.	Northern Limit.		Central Line.		Southern Limit.		Duration of Total Phase on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
imits.	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	m "
3 ^h 35 ^m	+25 55	-129 47	+25 41	-129 58	+25 27	-130 9	1 2.9
40	31 2.6	140 55.8	31 6.8	141 54.8	31 9.4	142 51.6	1 15.3
45	34 50.5	148 47.9	34 44.9	149 32.5	34 38.6	150 16.5	1 24.6
50	37 26.8	154 12.9	37 16.8	154 53.2	37 6.3	155 33.0	1 32.4
55	39 31.8	158 40.9	39 18.8	159 18.7	39 5.3	159 56.0	1 39.3
	41 17.5	162 37.8	41 2.0	163 13.8	40 46.1	163 49.1	
0	+42 49.2	-166 15.7	+42 31.6	-166 49.8	+42 13.7	-167 23.4	1 45.4
5	44 10.0	169 40.6	43 50.5	170 13.2	43 30.7	170 45.1	1 51.1
10	45 21.6	172 57.1	45 0.4	173 28.0	44 39.0	173 58.2	1 56.2
15	46 25.1	176 7.8	46 2.4	176 36.8	45 39.5	-177 5.1	2 0.8
20	47 21.4	-179 14.5	46 57.4	-179 41.4	46 33.1	+179 52.3	2 4.9
25	48 11.1	+177 41.5	47 45.9	+177 16.8	47 20.4	176 52.7	2 8.7
30	+48 54.6	+174 39.2	+48 28.3	+174 17.0	+48 1.7	+173 55.2	2 12.0
35	49 32.1	171 38.0	49 4.8	171 18.3	48 37.4	170 59.1	2 14.8
40	50 4.0	168 37.4	49 35.8	168 20.5	49 7.5	168 3.9	2 17.3
45	50 30.2	165 37.0	50 1.4	165 23.0	49 32.4	165 9.3	2 19.3
50	50 50.9	162 36.8	50 21.5	162 25.8	49 52.1	162 15.0	2 20.9
55	51 6.3	159 36.5	50 36.5	159 28.7	50 6.6	159 21.0	2 22.0
10 0	+51 16.2	+156 36.2	+50 46.2	+156 31.6	+50 16.1	+156 27.1	2 22.7
5	51 20.9	153 36.0	50 50.8	153 34.6	50 20.6	153 33.2	2 23.0
10	51 20.3	150 35.8	50 50.2	150 37.6	50 20.0	150 39.4	2 22.8
15	51 14.3	147 35.7	50 44.4	147 40.8	50 14.5	147 45.7	2 22.2
20	51 3.1	144 35.8	50 33.5	144 44.1	50 4.0	144 52.1	2 21.2
25	50 46.6	141 36.2	50 17.5	141 47.5	49 48.3	141 58.5	2 19.7
30	+50 24.6	+138 36.7	+49 56.1	+138 51.0	+49 27.6	+139 4.8	2 17.8
35	49 57.2	135 37.4	49 29.5	135 54.4	49 1.7	136 11.0	2 15.4
40	49 24.2	132 37.9	48 57.4	132 57.5	48 30.5	133 16.7	2 12.7
45	48 45.6	129 37.9	48 19.8	130 0.0	47 53.9	130 21.6	2 9.5
50	48 1.0	126 37.1	47 36.4	127 1.4	47 11.6	127 25.1	2 5.9
55	47 10.3	123 34.6	46 47.0	124 1.0	46 23.4	124 26.7	2 1.9
1 0	+46 13.1	+120 29.6	+45 51.2	+120 57.8	+45 28.9	+121 25.4	1 57.5
5	45 8.7	117 20.7	44 48.3	117 50.6	44 27.6	118 19.9	1 52.7
10	43 56.4	114 6.0	43 37.8	114 37.5	43 18.6	115 8.3	1 47.4
15	42 35.1	110 42.9	42 18.2	111 15.8	42 1.0	111 48.1	1 41.6
20	41 2.9	107 7.4	40 48.1	107 41.7	40 32.8	108 15.5	1 35.2
25	39 16.8	103 12.9	39 4.4	103 48.8	38 51.6	104 24.3	1 28.2
30	+37 11.7	+ 98 47.8	+37 2.2	+ 99 25.9	+36 52.4	+100 3.4	1 20.3
35	34 35.9	93 26.7	34 30.6	94 8.5	34 24.7	94 49.6	1 11.0
40	30 51.0	85 43.9	30 54.5	86 37.8	30 56.7	87 30.0	0 58.7
imits.	+25 35	+ 74 20	+25 23	+ 74 31	+25 11	+ 74 41	...

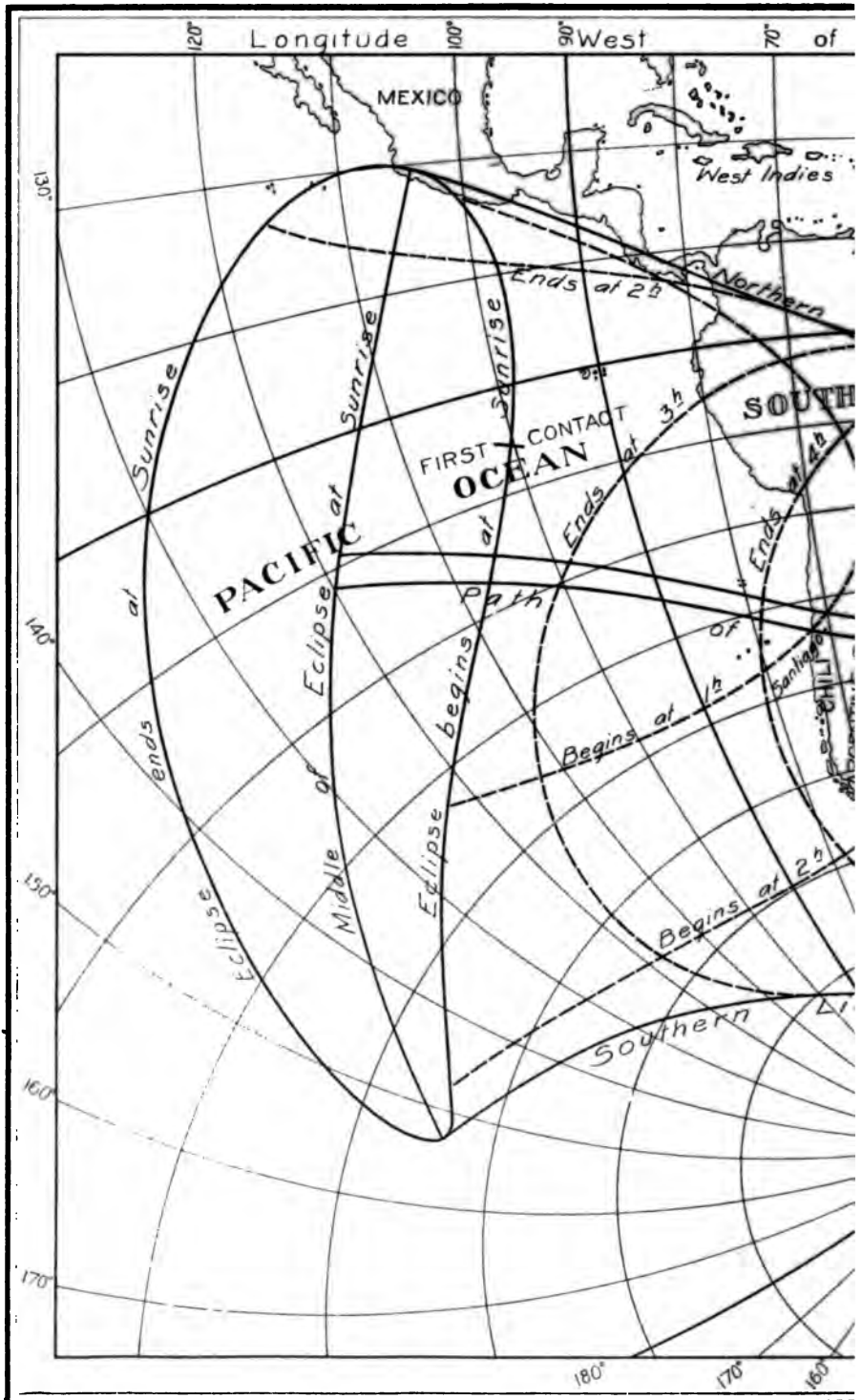
BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1918, DECEMBER 3.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Umbra on Fundamental Plane.	
	x	y	Log $\sin d$	Log $\cos d$	μ	l_1	l_2
$h \quad m$					$^{\circ} \quad '$		
0 20	-1.57022	-0.17167	-9.57425	+9.96706	7 34.7	+0.56875	+0.02271
30	1.48444	0.17543	9.57427	9.96705	10 4.7	0.56875	0.02272
40	1.39865	0.17918	9.57429	9.96705	12 34.7	0.56875	0.02271
50	1.31287	0.18292	9.57431	9.96705	15 4.7	0.56874	0.02271
1 0	-1.22708	-0.18665	-9.57433	+9.96704	17 34.6	+0.56873	+0.02270
10	1.14128	0.19038	9.57434	9.96704	20 4.6	0.56873	0.02270
20	1.05549	0.19409	9.57436	9.96704	22 34.6	0.56872	0.02269
30	0.96969	0.19780	9.57438	9.96703	25 4.5	0.56871	0.02268
40	0.88388	0.20150	9.57440	9.96703	27 34.5	0.56870	0.02267
50	0.79808	0.20518	9.57442	9.96703	30 4.5	0.56869	0.02266
2 0	-0.71227	-0.20886	-9.57444	+9.96702	32 34.5	+0.56868	+0.02265
10	0.62646	0.21254	9.57446	9.96702	35 4.4	0.56867	0.02264
20	0.54065	0.21620	9.57447	9.96702	37 34.4	0.56866	0.02263
30	0.45483	0.21985	9.57449	9.96702	40 4.4	0.56865	0.02262
40	0.36901	0.22350	9.57451	9.96701	42 34.4	0.56864	0.02261
50	0.28319	0.22713	9.57453	9.96701	45 4.3	0.56863	0.02260
3 0	-0.19737	-0.23076	-9.57455	+9.96701	47 34.3	+0.56862	+0.02259
10	0.11155	0.23438	9.57457	9.96700	50 4.3	0.56860	0.02257
20	-0.02573	0.23799	9.57459	9.96700	52 34.2	0.56859	0.02256
30	+0.06010	0.24159	9.57461	9.96700	55 4.2	0.56857	0.02254
40	0.14592	0.24518	9.57462	9.96699	57 34.2	0.56856	0.02253
50	0.23175	0.24877	9.57464	9.96699	60 4.2	0.56854	0.02251
4 0	+0.31757	-0.25234	-9.57466	+9.96699	62 34.1	+0.56853	+0.02250
10	0.40340	0.25591	9.57468	9.96699	65 4.1	0.56851	0.02248
20	0.48923	0.25946	9.57470	9.96698	67 34.1	0.56849	0.02246
30	0.57506	0.26301	9.57472	9.96698	70 4.1	0.56847	0.02245
40	0.66088	0.26655	9.57474	9.96698	72 34.0	0.56846	0.02243
50	0.74671	0.27008	9.57475	9.96697	75 4.0	0.56844	0.02241
5 0	+0.83254	-0.27360	-9.57477	+9.96697	77 34.0	+0.56842	+0.02239
10	0.91836	0.27711	9.57479	9.96697	80 3.9	0.56840	0.02237
20	1.00419	0.28062	9.57481	9.96696	82 33.9	0.56838	0.02235
30	1.09001	0.28411	9.57483	9.96696	85 3.9	0.56835	0.02233
40	1.17583	0.28760	9.57485	9.96696	87 33.9	0.56833	0.02230
50	1.26166	0.29108	9.57486	9.96695	90 3.8	0.56831	0.02228
6 0	+1.34748	-0.29455	-9.57488	+9.96695	92 33.8	+0.56829	+0.02226
10	1.43329	0.29801	9.57490	9.96695	95 3.8	0.56826	0.02223
20	1.51911	0.30146	9.57492	9.96695	97 33.8	0.56824	0.02221
30	+1.60492	-0.30490	-9.57494	+9.96694	100 3.7	+0.56821	+0.02219

Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Umbra.
$h \quad m$					
0 0	+7.9333	-6.5775	+1.1760	+7.67623	+7.67406
1 0	7.9334	6.5715	1.1760	7.67623	7.67406
2 0	7.9335	6.5653	1.1760	7.67623	7.67406
3 0	7.9336	6.5590	1.1760	7.67623	7.67406
4 0	7.9336	6.5527	1.1760	7.67623	7.67407
5 0	7.9336	6.5462	1.1760	7.67624	7.67407
6 0	7.9336	6.5396	1.1760	7.67624	7.67407
7 0	+7.9335	-6.5329	+1.1760	+7.67624	+7.67407

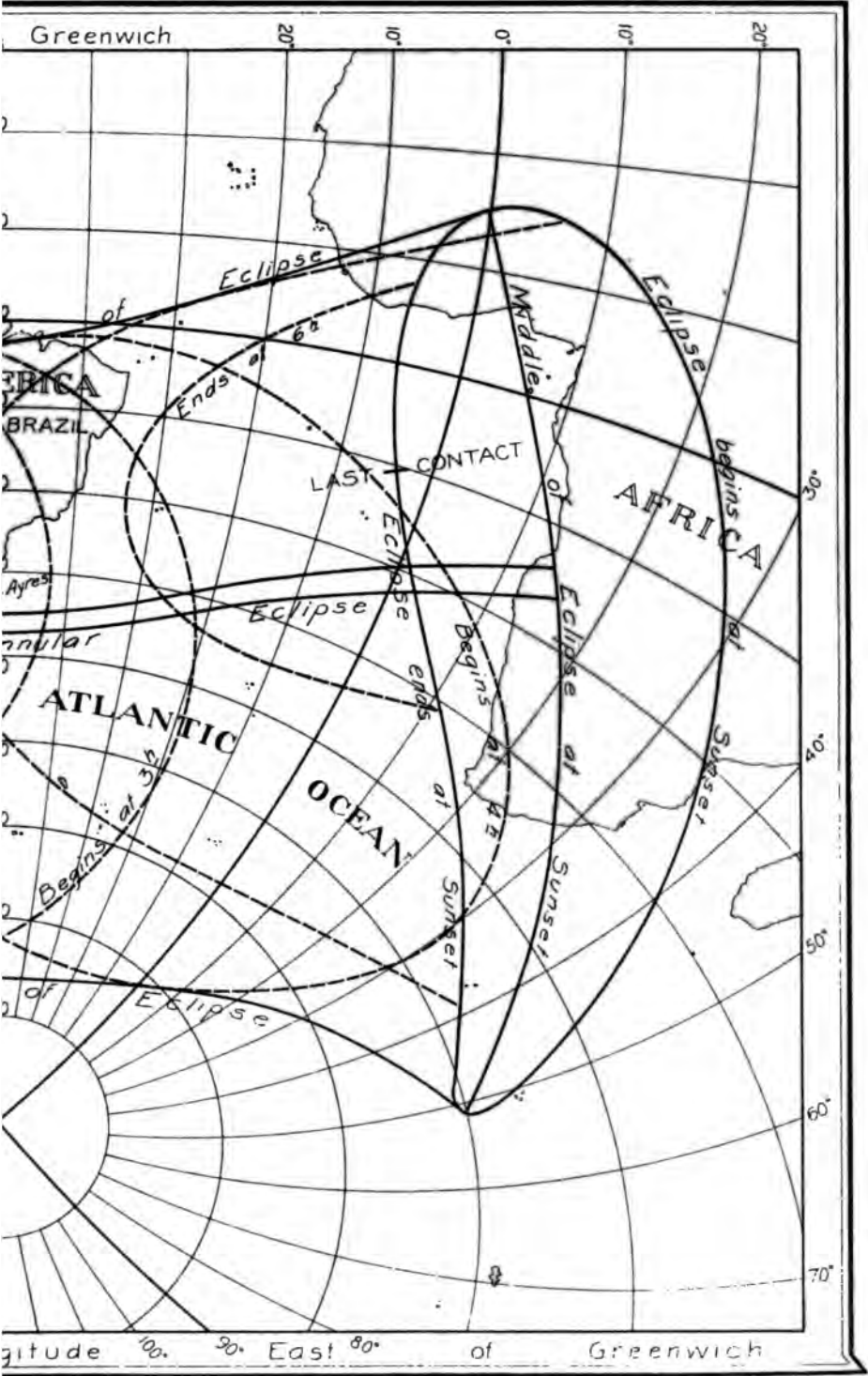


ANNULAR ECLIPSE



Note - The hours of beginning and end

DECEMBER 3RD 1918.



Expressed in Greenwich Mean Time.

PATH OF ANNULAR PHASE DURING THE ECLIPSE OF THE SUN,
1918, DECEMBER 3.

Green- wich Mean Time.	Northern Limit.		Central Line.		Southern Limit.		Duration of Annular Phase on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
limits.	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	m s
1 ^h 30 ^m	- 9 23	+118 20	-10 36	+119 7	-11 50	+119 55	. . .
35	13 48.0	108 18.1	13 46.9	111 40.9	12 43.4	117 43.7	5 8.7
40	17 16.3	101 5.4	17 49.2	103 1.7	18 18.4	105 10.7	5 23.6
45	19 37.1	96 24.7	20 18.3	97 58.6	20 58.0	99 39.2	5 34.0
50	21 29.6	92 43.2	22 15.1	94 5.1	22 59.8	95 31.5	5 42.9
55	23 5.1	89 35.0	23 53.4	90 48.6	24 41.1	92 5.9	5 50.9
	24 28.6	86 48.2	25 18.9	87 55.6	26 8.9	89 6.1	5 58.4
2 0	-25 42.9	+ 84 16.6	-26 34.8	+ 85 18.9	-27 26.7	+ 86 23.9	6 5.4
5	26 49.8	81 56.2	27 43.1	82 54.1	28 36.5	83 54.4	6 12.0
10	27 50.4	79 44.2	28 44.9	80 38.1	29 39.5	81 34.1	6 18.3
15	28 45.6	77 38.7	29 41.1	78 28.9	30 36.9	79 21.1	6 24.2
20	29 35.9	75 38.4	30 32.4	76 25.1	31 29.2	77 13.6	6 29.8
25	30 21.8	73 42.1	31 19.2	74 25.4	32 17.0	75 10.5	6 35.1
30	-31 3.7	+ 71 49.1	-32 1.9	+ 72 29.2	-33 0.6	+ 73 10.8	6 40.0
35	31 41.8	69 58.6	32 40.8	70 35.5	33 40.2	71 13.8	6 44.5
40	32 16.3	68 10.3	33 16.0	68 44.0	34 16.2	69 18.9	6 48.7
45	32 47.4	66 23.6	33 47.8	66 54.1	34 48.6	67 25.7	6 52.4
50	33 15.2	64 38.1	34 16.2	65 5.4	35 17.7	65 33.7	6 55.8
55	33 39.8	62 53.5	34 41.4	63 17.6	35 43.4	63 42.6	6 58.7
3 0	-34 1.3	+ 61 9.6	-35 3.4	+ 61 30.5	-36 5.9	+ 61 52.1	7 1.1
5	34 19.8	59 26.1	35 22.3	59 43.7	36 25.3	60 1.9	7 3.1
10	34 35.3	57 42.8	35 38.2	57 57.1	36 41.5	58 11.8	7 4.6
15	34 47.8	55 59.5	35 51.0	56 10.4	36 54.6	56 21.6	7 5.5
20	34 57.3	54 16.0	36 0.7	54 23.5	37 4.6	54 31.1	7 6.0
25	35 3.9	52 32.1	36 7.5	52 36.2	37 11.5	52 40.2	7 5.9
30	-35 7.5	+ 50 47.7	-36 11.1	+ 50 48.3	-37 15.3	+ 50 48.7	7 5.4
35	35 8.1	49 2.7	36 11.8	48 59.7	37 15.9	48 56.5	7 4.3
40	35 5.6	47 16.7	36 9.2	47 10.2	37 13.3	47 3.3	7 2.7
45	35 0.0	45 29.7	36 3.5	45 19.6	37 7.5	45 9.0	7 0.6
50	34 51.3	43 41.4	35 54.6	43 27.7	36 58.3	43 13.4	6 58.0
55	34 39.3	41 51.6	35 42.3	41 34.3	36 45.8	41 16.2	6 54.9
4 0	-34 23.9	+ 40 0.0	-35 26.6	+ 39 39.2	-36 29.7	+ 39 17.2	6 51.3
5	34 5.1	38 6.4	35 7.4	37 41.9	36 10.0	37 16.1	6 47.4
10	33 42.6	36 10.4	34 44.4	35 42.2	35 46.5	35 12.5	6 42.9
15	33 16.2	34 11.5	34 17.5	33 39.5	35 18.9	33 5.9	6 38.1
20	32 45.8	32 9.3	33 46.4	31 33.4	34 47.1	30 55.7	6 32.9
25	32 11.0	30 3.0	33 10.8	29 23.1	34 10.7	28 41.2	6 27.3
30	-31 31.4	+ 27 51.8	-32 30.2	+ 27 7.7	-33 29.2	+ 26 21.5	6 21.3
35	30 46.5	25 34.6	31 44.3	24 46.1	32 42.1	23 55.2	6 15.0
40	29 55.6	23 9.9	30 52.1	22 16.6	31 48.7	21 20.8	6 8.3
45	28 57.7	20 35.7	29 52.9	19 37.2	30 47.9	18 35.7	6 1.3
50	27 51.8	17 48.9	28 45.1	16 44.5	29 38.1	15 36.5	5 53.8
55	26 35.5	14 45.1	27 26.5	13 33.4	28 17.0	12 17.3	5 45.9
5 0	-25 5.7	+ 11 16.8	-25 53.5	+ 9 55.4	-26 40.2	+ 8 28.5	5 37.2
5	23 16.1	7 9.6	23 58.7	+ 5 33.6	24 39.3	+ 3 39.4	5 27.7
10	20 51.7	+ 1 48.9	21 23.1	- 0 16.6	21 49.0	- 2 39.7	5 16.3
limits.	-13 52	- 14 12	-15 4	- 14 59	-16 16	- 15 47	. . .

LOCAL CIRCUMSTANCES OF THE ECLIPSE OF THE SUN, 1918, JUNE 8.

Place.	Beginning.			Middle.		Ending.		
	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.	Greenwich Mean Time.	Magnitude.	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.
	h m	°	°	h m		h m	°	°
Albany, N. Y.	10 30	256	206	11 23	0.64	12 14	118	74
Allegheny, Pa.	10 30	263	208	11 27	0.74	12 20	113	66
Amherst, Mass.	10 30	256	205	11 24	0.64	12 13	119	75
Ann Arbor, Mich.	10 26	263	210	11 25	0.74	12 20	113	66
Appleton, Wis.	10 21	263	212	11 22	0.75	12 18	113	66
Atlanta, Ga.	10 36	274	212	11 36	0.92	12 32	103	49
Augusta, Me.	10 29	252	204	11 20	0.58	12 8	122	80
Austin, Tex.	10 34	288	220	11 40	0.87	12 39	92	30
Baton Rouge, La.	10 37	283	216	11 40	0.95	12 38	96	37
Berkeley, Cal.	9 49	290	240	11 10	0.79	12 22	86	27
Bismarck, N. Dak.	10 7	266	219	11 14	0.81	12 16	109	62
Boise City, Idaho	9 51	278	233	11 8	0.99	12 18	97	45
Buffalo, N. Y.	10 28	259	207	11 24	0.69	12 16	116	71
Cambridge, Mass.	10 31	255	205	11 23	0.63	12 12	119	76
Carson City, Nev.	9 52	286	237	11 11	0.85	12 22	90	32
Charleston, W. Va.	10 32	266	210	11 30	0.80	12 24	110	60
Charlottesville, Va.	10 33	265	208	11 30	0.77	12 23	111	62
Cheyenne, Wyo.	10 10	276	222	11 21	0.97	12 25	101	48
Cincinnati, Ohio	10 29	267	211	11 30	0.81	12 24	110	60
Cleveland, Ohio	10 28	262	209	11 26	0.74	12 20	113	66
Columbia, Mo.	10 25	272	215	11 29	0.89	12 28	105	53
Columbia, S. C.	10 37	272	211	11 36	0.88	12 30	105	52
Columbus, Ohio	10 29	265	210	11 28	0.78	12 23	111	62
Denver, Colo.	10 12	278	222	11 24 ¹	1.01 ¹	12 27	99	44
Des Moines, Iowa	10 20	269	215	11 25	0.85	12 24	107	57
Dover, Del.	10 33	262	207	11 28	0.72	12 20	114	67
Evanston, Ill.	10 24	265	212	11 25	0.78	12 22	111	63
Flagstaff, Ariz.	10 11	289	227	11 26	0.83	12 32	89	29
Geneva, N. Y.	10 28	258	207	11 24	0.67	12 15	117	72
Greencastle, Ind.	10 28	268	212	11 29	0.82	12 25	109	59
Hanover, N. H.	10 29	254	205	11 22	0.61	12 11	120	77
Harrisburg, Pa.	10 31	261	207	11 27	0.72	12 19	114	68
Helena, Mont.	9 54	272	229	11 8	0.92	12 15	103	55
Honolulu, Hawaii	9 1	331	61	9 45	0.09	10 30	23	203
Iowa City, Iowa	10 22	268	214	11 25	0.83	12 23	108	59
Ithaca, N. Y.	10 29	258	206	11 24	0.67	12 16	117	72
Jackson, Miss.	10 35	280	215	11 38 ²	1.00 ²	12 35	98	42
Juneau, Alaska	9 15	258	254	10 29	0.77	11 40	108	79
Kansas City, Mo.	10 23	273	216	11 28	0.91	12 28	104	51
Little Rock, Ark.	10 30	278	216	11 35	0.99	12 33	100	45
Louisville, Ky.	10 30	269	212	11 31	0.84	12 26	108	57
Madison, Wis.	10 22	265	212	11 24	0.78	12 20	111	63
Minneapolis, Minn.	10 16	265	214	11 20	0.78	12 18	111	64
Montgomery, Ala.	10 37	277	213	11 38	0.97	12 34	101	45
Mount Hamilton, Cal.	9 51	290	238	11 12	0.78	12 23	86	26
Mount Wilson, Cal.	10 3	294	233	11 21	0.74	12 29	84	21
Nashville, Tenn.	10 32	273	212	11 34	0.90	12 30	105	52

¹ Duration of totality 1m.5.² Duration of totality 6m.8.

LOCAL CIRCUMSTANCES OF THE ECLIPSE OF THE SUN, 1918, JUNE 8.

Place.	Beginning.			Middle.		Ending.		
	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.	Greenwich Mean Time.	Magni- tude.	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.
	h m	°	°	h m		h m	°	°
Haven, Conn. . . .	10 31	258	206	11 25	0.66	12 15	117	73
Orleans, La. . . .	10 38	283	216	11 41	0.95	12 38	96	37
York, N. Y. . . .	10 32	259	206	11 26	0.68	12 16	116	71
, Alaska	8 49	246	265	9 55	0.63	11 2	111	111
oma City, Okla. . .	10 26	280	218	11 33	0.99	12 33	98	42
a, Nebr.	10 19	271	216	11 25	0.88	12 25	106	55
, Me.	10 29	251	203	11 19	0.56	12 7	123	82
d, Miss.	10 33	277	214	11 36	0.96	12 33	101	46
na, Panama	11 8	308	226	....	....	....	....	....
elphia, Pa. . . .	10 32	261	207	11 27	0.71	12 18	115	68
nix, Ariz.	10 13	292	228	11 28	0.79	12 33	87	25
, S. Dak.	10 11	269	219	11 18	0.86	12 20	107	58
nd, Oreg.	9 38	277	243	10 58	0.99	12 11	96	46
keepsie, N. Y. . .	10 31	258	206	11 25	0.66	12 15	117	70
gh, N. C.	10 36	268	209	11 33	0.82	12 26	109	58
mond, Va.	10 34	265	208	11 31	0.77	12 23	111	62
mento, Cal. . . .	9 50	288	239	11 10	0.82	12 22	88	30
ake City, Utah . .	10 1	280	228	11 17	0.97	12 24	96	42
uan, P. R.	10 52	284	213	....	....	....	....	....
Fe, N. Mex. . . .	10 17	285	223	11 29	0.91	12 33	94	35
le, Wash.	9 37	273	243	10 56	0.98	12 8	99	52
gfield, Ill. . . .	10 26	269	213	11 28	0.85	12 25	108	57
uis, Mo.	10 27	271	214	11 30	0.88	12 27	106	54
use, N. Y.	10 28	258	206	11 23	0.66	12 14	118	73
assee, Fla. . . .	10 40	279	213	11 40	0.99	12 35	99	43
ra, Kans.	10 22	274	216	11 28	0.93	12 28	103	50
loosa, Ala. . . .	10 35	277	214	11 37	0.97	12 34	101	46
, Cal.	9 46	288	242	11 7	0.82	12 20	87	30
na, Ill.	10 26	268	212	11 28	0.83	12 25	108	58
ington, D. C. . .	10 33	263	208	11 29	0.74	12 21	113	65
ms Bay, Wis. . .	10 23	265	212	11 24	0.78	12 21	111	63

MEAN PLACES FOR 1918.0. (January 0^d.673, Greenwich.)

Name of Star.		Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion	
			h	m	s	s	°	'	"	"	
36	Piscium	6.2	0	12	21.141	-0.0027	+	7	47	6.29	-0.006
d	Piscium	5.4	0	16	22.647	+0.0003		7	44	5.88	+0.016
136 B.	Piscium	6.5	0	36	57.549	-0.0064		8	54	27.93	-0.063
75	Piscium	6.3	1	2	14.659	+0.0012		12	31	0.99	+0.042
7	Piscium	3.7	1	27	5.542	+0.0015		14	55	24.68	-0.003
101	Piscium	6.2	1	31	23.230	+0.0010	+	14	14	33.62	-0.002
105	Piscium	6.1	1	35	15.177	+0.0063		15	59	25.03	-0.006
4	Arietis	5.8	1	43	43.866	+0.0035		16	32	52.24	-0.021
z	Arietis	5.1	1	52	52.051	+0.0021		17	25	3.64	-0.020
35 B.	Arietis	6.4	1	59	12.551	-0.0008		17	51	34.92	-0.018
47 B.	Arietis	6.5	2	3	15.568	-0.0037	+	17	38	21.41	-0.007
20 H ¹ .	Arietis	6.4	2	4	52.640	+0.0112		16	50	24.96	-0.179
26	Arietis	6.2	2	26	2.267	+0.0050		19	29	31.46	-0.022
27	Arietis	6.4	2	26	21.324	+0.0029		17	20	30.41	-0.096
μ	Arietis	5.7	2	37	44.355	+0.0023		19	39	46.32	-0.038
36	Arietis	6.5	2	39	44.391	+0.0036	+	17	25	2.73	-0.040
40	Arietis	6.0	2	43	56.044	+0.0030		17	56	34.79	-0.020
45	Arietis	6.0	2	51	11.799	-0.0011		18	0	0.81	-0.006
ρ	Arietis	5.6	2	51	48.226	+0.0196		17	41	48.90	-0.206
47	Arietis	5.8	2	53	23.389	+0.0160		20	20	26.73	-0.021
s	Arietis (<i>mean</i>)	4.6	2	54	31.161	-0.0009	+	21	0	47.17	-0.010
54	Arietis	6.5	3	3	41.984	+0.0018		18	28	52.08	-0.014
δ	Arietis	4.5	3	6	56.215	+0.0110		19	25	2.93	+0.001
ζ	Arietis	5.0	3	10	11.074	-0.0019		20	44	28.71	-0.063
τ	Arietis	5.2	3	16	29.388	+0.0023		20	51	8.08	-0.033
63	Arietis	5.2	3	18	1.880	-0.0032	+	20	26	58.95	-0.009
65	Arietis	6.0	3	19	42.238	+0.0006		20	30	48.11	-0.006
66	Arietis	6.1	3	23	38.780	+0.0006		22	31	19.93	-0.112
14 H ¹ .	Tauri	6.5	3	34	14.360	.....		20	38	58.15	.....
22 H ¹ .	Tauri	6.1	3	39	41.685	+0.0008		20	40 14.45		-0.006
23	Tauri	4.3	3	41	27.353	+0.0016	+	23	41	37.52	-0.050
104 B.	Tauri	5.5	3	43	29.329	+0.0008		23	10	12.80	-0.045
27	Tauri	3.7	3	44	16.977	+0.0013		23	48	13.03	-0.048
28	Tauri	5.2	3	44	18.268	+0.0009		23	53	13.67	-0.046
133 B.	Tauri	5.9	3	45	5.721	+0.0026		21	59	44.12	-0.042
32	Tauri	5.8	3	52	1.138	+0.0045	+	22	14	33.85	-0.112
33	Tauri	6.0	3	52	12.033	+0.0026		22	56	18.57	-0.009
161 B.	Tauri	6.5	3	56	4.659	+0.0027		22	58	14.47	-0.052
36	Tauri	5.6	3	59	27.228	+0.0001		23	52	51.85	-0.022
Δ	Tauri	4.5	3	59	50.682	+0.0070		21	51	31.94	-0.058
39	Tauri	6.1	4	0	28.816	+0.0124	+	21	47	18.93	-0.131
192 B.	Tauri	6.1	4	7	59.261	-0.0016		22	12	12.84	-0.019
51	Tauri	5.6	4	13	31.882	+0.0071		21	22	47.34	-0.041
53	Tauri	5.3	4	14	35.995	+0.0028		20	56	41.69	-0.051
56	Tauri	5.2	4	14	45.309	+0.0032		21	34	35.06	-0.040
227 B.	Tauri	5.9	4	18	42.322	+0.0019	+	20	47	30.83	-0.031
62	Tauri	6.1	4	19	2.978	+0.0008		24	6	39.32	-0.019
κ	Tauri	4.1	4	20	28.731	+0.0062		22	6	26.28	-0.042
67	Tauri	5.4	4	20	31.860	+0.0093		22	0	48.53	-0.048
υ	Tauri	4.2	4	21	23.899	+0.0079		22	37	43.03	-0.048
72	Tauri	5.4	4	22	23.082	+0.0004	+	22	48	45.41	-0.006
247 B.	Tauri	5.8	4	23	8.609	+0.0073		21	26	15.61	-0.076
284 B.	Tauri	6.0	4	31	32.797	+0.0108		23	10	26.79	-0.102
τ	Tauri	4.3	4	37	19.291	+0.0007	+	22	48	2.40	-0.020

MEAN PLACES FOR 1918.0. (January 0^d.673, Greenwich.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	" ' "	"
Tauri	6.2	4 38 15.758	+0.0014	+23 56 4.09	-0.030
B. Tauri	6.2	4 40 45.306	+0.0005	23 28 43.23	+0.004
B. Tauri	6.3	4 51 15.858	-0.0001	24 27 43.78	-0.033
Tauri	6.0	4 52 50.018	+0.0003	23 49 17.10	-0.035
Tauri	5.6	4 53 8.202	+0.0023	24 55 29.01	-0.061
Tauri	4.7	4 58 11.591	+0.0056	+21 28 25.73	-0.049
Tauri	6.0	5 3 1.153	+0.0004	21 35 50.34	-0.007
Tauri	5.5	5 3 6.731	+0.0003	24 9 27.85	-0.022
Tauri	6.2	5 10 31.857	-0.0005	22 11 31.27	-0.025
Tauri	5.1	5 14 20.959	+0.0021	22 0 46.06	-0.083
Tauri	4.8	5 22 42.531	+0.0006	+21 52 4.83	-0.010
Tauri	5.4	5 24 13.667	+0.0015	25 5 6.45	-0.038
Tauri	5.1	5 30 26.564	+0.0010	23 59 9.97	-0.031
Tauri	3.0	5 32 44.605	+0.0006	21 5 36.75	-0.032
E. Tauri	6.5	5 37 6.419	-0.0020	22 37 14.64	+0.018
3. Tauri	6.0	5 38 20.733	+0.0011	+23 9 58.76	-0.042
Tauri	5.0	5 43 58.988	0.0000	24 32 28.18	-0.023
3. Tauri	5.8	5 51 54.828	....	24 14 19.62	...
Tauri	6.3	5 56 44.490	-0.0009	22 24 0.15	-0.011
Geminorum	4.3	5 59 8.153	+0.0002	23 16 7.80	-0.109
3. Geminorum	6.0	6 4 35.911	+0.0021	+22 12 14.77	-0.040
Geminorum	5.6	6 4 45.296	+0.0014	23 7 40.90	+0.001
Geminorum	5.9	6 6 30.622	+0.0011	24 26 21.81	-0.061
Geminorum	6.3	6 7 20.883	+0.0007	22 55 41.20	-0.013
Geminorum (var.)	3.2	6 9 55.721	-0.0038	22 31 54.03	-0.016
Geminorum	6.1	6 11 18.452	-0.0009	+23 59 51.00	-0.026
Geminorum	6.2	6 11 58.581	+0.0004	23 46 11.08	-0.008
Geminorum	3.2	6 18 0.017	+0.0046	22 33 24.62	-0.114
3. Geminorum	6.0	6 20 33.932	-0.0004	23 22 25.66	+0.015
Geminorum	6.5	6 22 53.404	-0.0015	20 50 26.66	-0.054
Geminorum	6.2	6 23 4.099	-0.0019	+20 32 47.39	-0.005
Geminorum	4.1	6 24 5.668	-0.0005	20 15 54.64	-0.016
Geminorum	5.2	6 46 38.291	+0.0003	21 51 32.09	-0.045
Geminorum (var.)	3.7	6 59 14.808	-0.0002	20 41 29.92	-0.007
Geminorum	5.9	7 0 22.264	0.0000	22 45 40.68	-0.020
3. Geminorum	6.5	7 5 14.970	-0.0082	+21 23 27.83	-0.448
Geminorum	5.2	7 17 6.612	-0.0044	20 35 58.23	-0.025
3. Geminorum	6.4	7 21 59.612	-0.0219	21 42 2.11	-0.022
Geminorum	5.8	7 22 6.416	-0.0002	20 25 20.43	-0.023
Geminorum	5.3	7 22 52.450	-0.0035	21 36 50.89	-0.110
Geminorum	5.3	7 34 44.538	-0.0002	+17 51 44.60	+0.004
Geminorum	6.3	7 40 20.595	-0.0013	20 30 49.93	-0.012
Geminorum	5.0	7 41 22.724	-0.0048	18 42 39.94	-0.063
3. Geminorum	6.2	7 47 10.752	-0.0029	19 32 9.78	-0.030
Canceri	6.0	7 52 20.205	-0.0021	16 0 36.94	-0.044
3. Canceri	6.0	7 53 50.914	+0.0003	+16 44 26.27	+0.004
Canceri	5.7	7 56 5.519	-0.0001	17 32 3.38	-0.010
Canceri	5.9	7 56 49.990	+0.0004	16 40 56.64	0.000
E. Canceri	6.1	8 0 1.053	-0.0020	19 4 28.54	-0.046
Canceri (mean)	4.7	8 7 30.686	+0.0051	17 53 46.03	-0.128
Canceri	6.2	8 21 11.539	-0.0132	+17 19 2.62	-0.153
Canceri	5.9	8 24 2.877	-0.0017	14 28 58.88	-0.022
3. Canceri	6.4	8 29 12.618	-0.0023	13 32 17.35	-0.035
3. Canceri	6.3	8 31 31.939	+0.0006	+15 35 52.74	-0.022

MEAN PLACES FOR 1918.0. (January 0^d.673, Greenwich.)

Name of Star.		Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion.
			h	m	s	s	°	'	"	"
4 ¹	Cancrī	5.5	8	38	41.356	-0.0002	+12	58	32.81	-0.002
4 ²	Cancrī	5.7	8	42	26.428	-0.0049	12	24	41.84	-0.007
54	Cancrī	6.3	8	46	27.594	-0.0075	15	39	20.24	+0.006
60	Cancrī	5.7	8	51	27.045	-0.0009	11	56	24.02	-0.009
α	Cancrī	4.3	8	54	0.277	+0.0024	12	10	33.09	-0.002
κ	Cancrī	5.1	9	3	18.477	-0.0012	+10	59	56.09	-0.003
209 B.	Cancrī	6.5	9	5	19.218	-0.0008	11	53	56.53	-0.007
222 B.	Cancrī	6.3	9	13	24.974	+0.0046	11	50	42.74	-0.007
ω	Leonis	5.5	9	24	4.096	+0.0038	9	24	52.11	-0.002
ξ	Leonis	5.1	9	27	31.684	-0.0063	11	39	49.04	-0.004
h	Leonis	5.2	9	27	34.006	+0.0001	+10	4	41.00	-0.003
o	Leonis	3.8	9	36	46.575	-0.0096	10	15	57.96	-0.002
83 B.	Leonis	5.9	9	52	5.198	-0.0074	9	19	20.44	+0.017
89 B.	Leonis	6.2	9	53	47.107	+0.0010	8	42	21.35	-0.009
π	Leonis	4.9	9	55	52.892	-0.0029	8	26	17.49	-0.007
14	Sextantis . . .	6.3	10	2	30.238	-0.0022	+ 6	0	43.52	-0.002
19	Sextantis . . .	5.9	10	8	32.395	-0.0037	5	1	13.54	-0.006
155 B.	Leonis	6.5	10	18	59.126	-0.0167	6	6	38.23	-0.071
237 B.	Leonis	6.3	10	48	0.978	+0.0002	1	27	35.90	-0.005
55	Leonis	6.1	10	51	29.343	+0.0073	1	10	27.52	-0.013
p ³	Leonis	6.1	10	59	24.789	-0.0045	+ 0	26	27.72	+0.006
p ⁴	Leonis	5.3	11	9	33.737	-0.0029	+ 0	22	36.62	-0.006
388 B.	Leonis	6.3	11	23	42.319	-0.0025	- 1	14	54.22	+0.007
e	Leonis	5.1	11	26	7.522	+0.0018	2	33	2.69	-0.008
431 B.	Leonis	6.2	11	34	12.646	-0.0028	1	58	56.90	+0.047
13 B.	Virginis . . .	5.9	11	46	50.725	+0.0008	- 4	52	37.76	+0.006
64 B.	Virginis . . .	6.5	12	6	14.749	-0.0004	7	19	5.32	+0.017
78 B.	Virginis . . .	6.5	12	10	3.393	-0.0061	5	15	47.54	+0.114
q	Virginis . . .	5.3	12	29	32.728	-0.0067	8	59	59.06	+0.004
χ	Virginis . . .	4.8	12	35	0.730	-0.0066	7	32	40.18	-0.031
370 B.	Virginis . . .	6.0	12	50	2.558	-0.0058	-11	12	15.27	-0.037
φ	Virginis . . .	5.0	12	50	5.186	-0.0024	9	5	38.03	-0.026
49	Virginis . . .	5.2	13	3	35.918	+0.0007	10	18	8.17	-0.014
i	Virginis . . .	5.7	13	22	23.073	-0.0096	12	16	52.45	-0.022
75	Virginis . . .	5.6	13	28	28.613	-0.0060	14	56	29.30	+0.004
550 B.	Virginis . . .	6.0	13	30	18.721	-0.0040	-12	47	38.99	-0.014
83	Virginis . . .	5.6	13	40	4.172	+0.0007	15	46	1.61	-0.011
85	Virginis . . .	6.1	13	41	9.997	-0.0029	15	21	21.35	-0.034
214 G.	Virginis . . .	6.5	14	0	45.579	-0.0096	15	56	37.65	-0.012
40 H.	Virginis . . .	5.1	14	6	21.602	+0.0008	15	54	54.68	-0.014
43 H.	Virginis . . .	5.5	14	10	52.768	-0.0031	-17	49	7.08	-0.015
231 G.	Virginis . . .	6.4	14	12	31.571	-0.0005	18	12	16.80	+0.106
236 G.	Virginis . . .	5.7	14	14	6.017	-0.0039	18	20	11.20	-0.001
9 G.	Libræ	6.5	14	30	13.737	+0.0032	20	4	48.21	-0.004
17 G.	Libræ	6.4	14	41	31.606	-0.0047	20	49	44.20	-0.121
18 G.	Libræ	6.1	14	42	33.687	-0.0032	-20	58	53.52	-0.014
43 B.	Libræ	5.7	14	52	40.444	+0.0746	21	2	48.93	-1.792
47 G.	Libræ	6.1	15	1	43.115	+0.0066	21	42	48.52	-0.050
z	Libræ	4.7	15	7	32.607	-0.0031	19	28	56.34	-0.053
25	Libræ	6.0	15	8	38.726	-0.0036	19	20	21.85	-0.035
64 G.	Libræ	5.8	15	11	37.581	-0.0028	-22	5	47.91	+0.018
147 B.	Libræ	6.2	15	25	51.757	+0.0020	20	26	49.59	-0.029
150 B.	Libræ	6.1	15	27	0.086	-0.0096	19	53	6.30	-0.081
11 H.	Libræ	5.4	15	27	53.932	-0.0012	-19	23	30.75	-0.086

MEAN PLACES FOR 1918.0. (January 0^d.673, Greenwich.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	" ' "	"
B. Libræ	6.0	15 32 58.600	-0.0017	-22 52 12.92	-0.068
B. Libræ	5.9	15 33 29.884	....	20 44 43.79	....
B. Libræ	6.2	15 34 31.778	-0.0016	22 52 58.17	-0.034
Libræ	5.0	15 35 25.807	-0.0018	23 33 8.83	-0.027
B. Scorpïi	5.3	15 49 2.814	-0.0023	23 44 4.04	-0.016
G. Scorpïi	5.9	15 52 52.848	+0.0012	-20 44 45.98	-0.020
Scorpïi	2.5	15 55 28.874	-0.0012	22 23 21.59	-0.035
B. Scorpïi	5.7	16 1 12.764	-0.0011	23 23 0.21	-0.004
Scorpïi	4.6	16 2 35.628	+0.0030	20 38 53.95	-0.061
G. Scorpïi	6.2	16 2 56.442	0.0000	24 14 37.02	-0.068
G. Scorpïi	5.8	16 3 49.843	+0.0032	-23 28 2.21	-0.012
G. Scorpïi	6.3	16 8 49.448	-0.0004	24 12 48.03	-0.034
B. Scorpïi	6.3	16 9 39.441	-0.0013	20 54 0.32	-0.043
G. Scorpïi	6.5	16 12 8.698	-0.0011	21 6 2.86	-0.029
Scorpïi	4.9	16 15 41.915	-0.0012	23 58 21.17	-0.013
Ophiuchi	4.7	16 20 39.854	-0.0015	-23 15 31.22	-0.008
Scorpïi	4.8	16 25 13.395	-0.0004	24 56 7.94	-0.016
Ophiuchi	4.5	16 27 16.398	+0.0014	21 17 30.91	+0.026
B. Scorpïi	6.1	16 36 37.894	-0.0024	24 18 35.53	-0.004
Ophiuchi	5.5	16 51 51.209	+0.0002	23 1 16.84	-0.034
B. Ophiuchi	6.3	16 54 56.363	+0.0005	-24 58 7.09	-0.015
Ophiuchi	5.8	16 55 7.989	+0.0036	24 51 53.61	-0.053
B. Ophiuchi	6.3	17 1 17.895	-0.0022	21 27 7.09	-0.083
B. Ophiuchi	6.3	17 7 11.626	+0.0058	25 9 17.36	-0.045
Ophiuchi	5.1	17 13 0.508	-0.0046	24 11 55.11	-0.011
Ophiuchi	3.4	17 16 58.302	-0.0006	-24 55 7.91	-0.036
B. Ophiuchi	5.9	17 19 47.731	-0.0008	21 21 58.57	-0.045
B. Ophiuchi	6.3	17 20 5.398	+0.0010	24 10 10.65	+0.017
Ophiuchi	4.3	17 21 21.609	-0.0009	24 6 4.18	-0.137
Ophiuchi	4.8	17 26 24.681	0.0000	23 54 1.06	-0.030
Ophiuchi	6.4	17 30 22.448	-0.0007	-21 59 21.72	-0.004
Ophiuchi	4.8	17 38 30.957	-0.0062	21 38 39.85	-0.052
Ophiuchi	6.1	17 49 51.287	-0.0001	24 52 18.87	-0.015
G. Sagittarii	4.8	17 54 47.137	+0.0001	23 48 35.03	-0.058
Sagittarii	5.7	17 56 56.255	-0.0013	22 46 45.82	-0.044
Sagittarii	5.5	17 57 49.558	-0.0003	-24 16 57.42	-0.007
Sagittarii	6.0	17 58 50.712	-0.0006	24 21 48.42	-0.006
G. Sagittarii	6.2	18 2 16.295	+0.0006	21 27 11.62	-0.003
Sagittarii	5.2	18 6 43.141	+0.0018	23 43 8.65	-0.042
Sagittarii	4.0	18 8 51.530	-0.0004	21 4 53.07	-0.002
Sagittarii	5.6	18 9 20.303	-0.0012	-21 44 9.69	-0.023
Sagittarii	5.3	18 10 19.391	+0.0003	20 45 12.75	+0.006
Sagittarii	5.0	18 20 27.999	0.0000	20 35 11.57	-0.024
B. Sagittarii	5.7	18 32 59.787	-0.0021	21 28 0.73	-0.100
B. Sagittarii	5.8	18 33 31.439	-0.0015	23 34 33.25	-0.020
B. Sagittarii	5.9	18 34 0.078	-0.0056	-21 7 14.03	-0.138
B. Sagittarii	6.3	18 40 24.998	+0.0019	21 5 9.26	-0.039
Sagittarii	5.6	18 41 23.944	+0.0018	22 28 44.11	+0.010
Sagittarii	5.3	18 44 48.222	+0.0005	20 25 8.31	+0.030
Sagittarii	6.2	18 45 54.684	-0.0041	22 15 24.87	-0.024
Sagittarii	5.8	18 49 6.052	-0.0008	-21 27 40.21	-0.015
Sagittarii	5.0	18 49 13.191	+0.0001	22 50 48.79	-0.022
Sagittarii	5.1	18 50 9.742	+0.0069	22 46 29.10	-0.302
Sagittarii	5.1	18 52 28.094	-0.0010	-20 45 52.60	-0.303

570 STARS OCCULTED BY THE MOON, 1918.

MEAN PLACES FOR 1918.0. (January 0^d.673, Greenwich.)

Name of Star.		Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion.
			h	m	s	s	"	"	"	"
ξ	Sagittarii	3.7	18	52	50.302	+0.0023	-21	12	55.91	-0.002
168 B.	Sagittarii	6.3	18	56	41.217	+0.0005	22	48	42.53	+0.009
171 B.	Sagittarii	6.1	18	58	14.649	0.0000	19	21	55.37	-0.005
173 B.	Sagittarii	6.4	18	58	18.166	+0.0020	19	13	20.01	...
o	Sagittarii	3.9	18	59	46.179	+0.0050	21	51	45.66	-0.002
187 B.	Sagittarii	6.4	19	2	20.553	+0.0036	-18	51	56.01	-0.004
190 B.	Sagittarii	5.4	19	3	27.684	+0.0001	19	25	10.99	-0.002
π	Sagittarii	3.0	19	4	53.281	-0.0005	21	9	18.05	-0.006
195 B.	Sagittarii	6.3	19	4	58.056	+0.0019	19	56	1.31	-0.009
199 B.	Sagittarii	6.4	19	7	34.045	-0.0003	21	47	43.97	-0.004
d	Sagittarii	5.0	19	12	50.269	-0.0015	-19	5	59.63	-0.017
226 B.	Sagittarii	6.4	19	16	48.883	+0.0002	19	23	18.93	+0.009
ρ	Sagittarii	4.0	19	16	55.078	-0.0020	18	0	9.49	+0.015
45	Sagittarii	6.0	19	17	3.950	+0.0064	18	27	40.20	-0.082
253 B.	Sagittarii	6.1	19	26	2.144	+0.0026	21	29	1.43	-0.028
266 B.	Sagittarii	6.1	19	31	39.301	+0.0003	-19	2	5.60	-0.009
267 B.	Sagittarii	5.8	19	32	17.980	+0.0011	18	24	50.80	-0.002
f	Sagittarii	5.1	19	41	34.796	-0.0099	19	57	33.05	-0.088
57	Sagittarii	6.0	19	47	26.191	+0.0001	19	15	14.95	-0.057
16 B.	Capricorni	6.2	20	16	10.240	+0.0025	15	2	39.13	+0.004
β	Capricorni	3.2	20	16	24.373	+0.0030	-15	2	28.25	+0.007
31 B.	Capricorni	6.4	20	24	6.448	+0.0013	16	0	48.84	+0.019
27 G.	Capricorni	6.2	20	26	28.661	-0.0058	15	19	53.48	-0.092
45 B.	Capricorni	6.1	20	29	37.863	+0.0035	14	0	14.26	+0.060
47 B.	Capricorni	6.2	20	30	53.351	+0.0055	16	48	30.23	-0.093
τ	Capricorni	5.2	20	34	41.360	+0.0006	-15	14	35.33	-0.015
61 B.	Capricorni	5.9	20	35	56.251	-0.0032	16	24	59.81	+0.082
84 B.	Capricorni	6.0	20	46	10.767	+0.0106	12	50	56.18	-0.084
95 B.	Capricorni	5.9	20	54	9.612	...	14	48	1.51	...
ν	Aquarii	4.5	21	5	7.716	+0.0057	11	42	15.54	-0.006
51 G.	Aquarii	6.5	21	9	50.570	-0.0010	-10	56	42.42	-0.051
53 B.	Aquarii	6.5	21	11	30.218	+0.0004	13	32	34.00	-0.039
17	Aquarii	6.3	21	18	32.571	-0.0022	9	40	10.26	-0.021
19	Aquarii	5.6	21	20	48.751	+0.0012	10	5	53.87	-0.164
72 B.	Aquarii	6.5	21	23	47.361	-0.0045	11	55	26.48	+0.008
ξ	Aquarii	4.8	21	33	23.285	+0.0075	-8	13	21.23	-0.023
137 B.	Capricorni	6.2	21	35	3.738	+0.0001	10	56	46.68	-0.010
c ¹	Capricorni	5.3	21	40	38.016	+0.0004	9	27	34.17	+0.008
c ²	Capricorni	6.3	21	41	53.874	+0.0008	9	39	17.81	+0.001
30	Aquarii	5.6	21	58	57.649	+0.0011	6	55	8.50	+0.016
138 B.	Aquarii	6.4	22	8	27.687	-0.0043	-5	7	31.78	-0.028
44	Aquarii	5.7	22	12	49.715	-0.0003	5	47	49.43	+0.029
51	Aquarii	5.8	22	19	50.631	+0.0011	5	15	8.52	-0.011
187 B.	Aquarii	6.3	22	27	4.006	-0.0051	3	19	53.01	-0.004
κ	Aquarii	5.2	22	33	30.640	-0.0049	4	39	4.77	-0.113
207 B.	Aquarii	6.3	22	36	33.431	...	-3	58	51.34	...
6 G.	Piscium	6.2	22	54	2.221	+0.0002	2	50	5.10	-0.082
3	Piscium	6.3	22	56	25.631	+0.0028	0	15	16.91	+0.014
22 B.	Piscium	6.4	23	19	19.543	+0.0043	-0	9	31.85	+0.038
κ	Piscium	4.9	23	22	43.734	+0.0056	+0	48	23.75	-0.093
9	Piscium	6.4	23	23	2.770	+0.0032	+0	40	19.54	-0.029
16	Piscium	5.7	23	32	12.204	-0.0074	1	38	49.39	+0.057
19	Piscium	5.4	23	42	12.033	-0.0034	3	1	54.65	-0.020
ω	Piscium	4.0	23	55	5.977	+0.0102	+6	24	33.85	-0.108

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.		
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.	
		$\Delta\alpha$	$\Delta\delta$									
		s	$''$	$''$	d	h	m	h	m	$''$	$''$	
83 B. Leonis	5.9	+2.03	-10.1	+ 9 19.2	1	1	4.5	+ 9 53.9	-1.1336	0.5076	-0.2128	-26 -81
89 B. Leonis	6.2	2.02	10.0	8 42.2		1	59.3	+10 47.1	-0.6489	0.5072	0.2133	+ 5 -79
π Leonis	4.9	2.01	9.9	8 26.1		3	7.0	+11 52.9	-0.5950	0.5068	0.2139	+ 8 -75
14 Sextantis	6.3	1.97	9.4	6 0.6		6	41.6	- 8 38.5	+1.3129	0.5054	0.2156	+87 +46
155 B. Leonis	6.5	1.90	9.9	6 6.5		15	40.0	+ 0 4.9	-0.7458	0.5024	0.2190	0 -84
237 B. Leonis	6.3	+1.75	-9.0	+ 1 27.4	2	7	40.0	- 8 21.5	+0.8616	0.4990	-0.2226	+90 + 7
55 Leonis	6.1	1.74	8.9	1 10.3		9	35.5	- 6 29.2	+0.7492	0.4987	0.2227	+90 0
p^3 Leonis	6.1	1.70	8.8	0 26.3		13	59.5	- 2 12.4	+0.5808	0.4982	0.2230	+78 - 9
p^5 Leonis	5.3	1.65	8.9	+ 0 22.5		19	38.1	+ 3 16.9	-0.6067	0.4978	0.2230	+ 8 -80
388 B. Leonis	6.3	1.58	8.5	- 1 15.0	3	3	30.1	+10 56.2	-0.5590	0.4979	0.2224	+10 -76
e Leonis	5.1	+1.57	- 8.1	- 2 33.2		4	50.8	-11 45.4	+0.5846	0.4979	-0.2222	+78 - 9
431 B. Leonis	6.2	1.53	8.3	1 59.1		9	20.3	- 7 23.2	-1.0411	0.4982	0.2214	-18 -90
13 B. Virginis	5.9	1.47	7.4	4 52.8		16	20.3	- 0 34.7	+0.6195	0.4991	0.2197	-80 - 7
64 B. Virginis	6.5	1.38	6.6	7 19.2	4	3	1.2	+ 9 48.5	+0.9904	0.5012	0.2160	+83 +15
q Virginis	5.3	1.27	6.0	9 0.1		15	41.4	- 1 52.5	+0.1478	0.5052	0.2096	+46 -32
370 B. Virginis	6.0	+1.17	- 5.1	-11 12.3	5	2	38.8	+ 8 46.3	+0.3167	0.5097	-0.2023	+55 -23
75 Virginis	5.6	0.99	3.7	14 56.6		22	36.1	+ 4 8.4	+0.5393	0.5205	0.1847	+66 -11
83 Virginis	5.6	0.94	3.3	15 46.1	6	4	27.0	+ 9 48.6	+0.3770	0.5242	0.1784	+55 -20
85 Virginis	6.1	0.93	3.5	15 21.4		5	0.0	+10 20.6	-0.1689	0.5246	0.1777	+24 -50
214 G. Virginis	6.5	0.84	3.1	15 56.7		14	41.1	- 4 16.3	-1.1920	0.5312	0.1659	-41 -90
43 H. Virginis	5.5	+0.80	- 2.4	-17 49.2		19	35.6	+ 0 28.9	+0.0427	0.5348	-0.1593	+33 -38
231 G. Virginis	6.4	0.80	2.2	18 12.3		20	23.2	+ 1 15.0	+0.3346	0.5353	0.1581	+49 -22
236 G. Virginis	5.7	0.79	2.2	18 20.2		21	8.5	+ 1 58.9	+0.3578	0.5359	0.1571	+51 -20
9 G. Libræ	6.5	0.72	1.5	20 4.8	7	4	48.1	+ 9 23.7	+1.0768	0.5416	0.1457	+70 +24
17 G. Libræ	6.4	0.67	1.2	20 49.8		10	4.4	- 9 30.5	+1.1334	0.5456	0.1373	+69 +31
18 G. Libræ	6.1	+0.67	- 1.1	-20 58.9		10	33.2	- 9 2.7	+1.2314	0.5460	-0.1364	+69 +42
43 B. Libræ	5.7	0.62	1.1	21 2.8		15	12.1	- 4 33.1	+0.6831	0.5496	0.1285	+68 - 2
47 G. Libræ	6.1	0.58	0.8	21 42.8		19	18.6	- 0 34.9	+0.8815	0.5528	0.1212	+68 +11
64 G. Libræ	5.8	0.54	0.6	22 5.8		23	45.5	+ 3 42.8	+0.7677	0.5562	0.1129	+68 + 4
169 B. Libræ	6.0	0.46	0.3	22 52.2	8	9	10.0	-11 12.6	+0.6112	0.5634	0.0942	+60 - 5
177 B. Libræ	6.2	+0.45	- 0.3	-22 53.0		9	50.6	-10 33.4	+0.5611	0.5638	-0.0927	+57 - 8
42 Libræ	5.0	0.45	0.1	23 33.1		10	14.1	-10 10.7	+1.2344	0.5641	0.0919	+66 +46
32 B. Scorpïi	5.3	0.39	0.0	23 44.1		16	6.2	- 4 31.4	+0.9202	0.5684	0.0793	+66 +15
δ Scorpïi	2.5	0.37	- 0.3	22 23.4		18	50.9	- 1 52.6	+0.7085	0.5703	0.0733	-17 -90
57 B. Scorpïi	5.7	0.35	0.0	23 23.0		21	16.7	+ 0 27.9	+0.1676	0.5720	0.0678	+30 -30
24 G. Scorpïi	6.2	+0.34	+ 0.2	-24 14.6		22	0.5	+ 1 10.1	+1.0238	0.5725	-0.0661	+66 +23
27 G. Scorpïi	5.8	0.34	0.0	23 28.0		22	23.0	+ 1 31.8	+0.1823	0.5727	0.0652	+31 -29
41 G. Scorpïi	6.3	0.32	0.2	24 12.8	9	0	29.0	+ 3 33.1	+0.8338	0.5741	0.0604	+66 + 9
19 Scorpïi	4.9	0.30	0.2	23 58.4		3	21.6	+ 6 19.3	+0.4160	0.5759	0.0536	+44 -16
ρ Ophiuchi	4.7	0.28	0.0	23 15.5		5	25.7	+ 8 18.7	-0.4378	0.5772	0.0487	- 5 -69
22 Scorpïi	4.8	+0.27	+ 0.4	-24 56.1		7	19.1	+10 7.9	+1.2291	0.5784	-0.0441	+65 +47
126 B. Scorpïi	6.1	0.23	0.3	24 18.6		12	1.1	- 9 20.7	+0.3927	0.5811	0.0326	+39 -18
24 Ophiuchi	5.5	0.18	0.1	23 1.3		18	13.7	- 3 22.4	-1.1014	0.5842	0.0170	-48 -90
88 B. Ophiuchi	6.3	0.17	0.5	24 58.1		19	28.8	- 2 10.1	+0.9019	0.5848	0.0138	+65 +14
26 Ophiuchi	5.8	0.17	0.4	24 51.9		19	33.5	- 2 5.6	+0.7931	0.5849	0.0136	+65 + 6
137 B. Ophiuchi	6.3	+0.14	+ 0.5	-25 9.3	10	0	25.6	+ 2 35.3	+1.0553	0.5870	-0.0010	+65 +27
39 Ophiuchi	5.1	0.12	0.3	24 11.9		2	45.8	+ 4 50.1	+0.0702	0.5879	+0.0051	+19 -36
θ Ophiuchi	3.4	0.11	0.5	24 55.1		4	21.1	+ 6 21.6	+0.8253	0.5884	0.0092	+65 + 9
191 B. Ophiuchi	6.3	0.10	0.3	24 10.2		5	36.0	+ 7 33.5	+0.0650	0.5889	0.0125	+19 -36
δ Ophiuchi	4.3	0.10	0.3	24 6.1		6	6.4	+ 8 2.8	+0.0011	0.5892	0.0138	+16 -40
51 Ophiuchi	4.8	+0.09	+ 0.3	-23 54.0		8	7.4	+ 9 59.1	-0.1726	0.5897	+0.0132	+ 7 -50

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Pa- rallel.			
Name.	Mag.	Red'ns from 1918.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
NEW					MOON.								
		s	"	"	d	h	m	h	m	"	"		
137 B. Capricorni	6.2	+0.12	+1.3	-10 56.8	14	13	8.8	+11	8.5	+0.8850	0.5664	+0.2293	+79 +9
c ¹ Capricorni	5.3	0.13	1.6	9 27.5	15	33.6	-10 31.8	-0.0380	0.5654	0.2316	+35 -42		
c ² Capricorni	6.3	0.14	1.6	9 39.3	16	6.5	-10 0.2	+0.2836	0.5652	0.2321	+54 -25		
30 Aquarii	5.6	+0.18	+2.2	-6 55.1	23	33.2	-2 49.3	-0.6868	0.5622	+0.2381	+2 -80		
44 Aquarii	5.7	0.23	2.6	5 47.8	15	53.9	+3 4.0	-0.3377	0.5601	0.2420	+21 -60		
51 Aquarii	5.8	0.25	2.8	5 15.1	8	45.6	+6 3.7	-0.1263	0.5590	0.2436	+32 -46		
187 B. Aquarii	6.3	0.27	3.3	3 19.8	11	58.0	+9 9.5	-1.2559	0.5580	0.2449	-38 -90		
κ Aquarii	5.2	0.30	3.0	4 39.0	14	50.2	+11 55.6	+0.7633	0.5572	0.2460	+85 +1		
207 B. Aquarii	6.3	+0.31	+3.2	-3 58.8	16	11.8	-10 45.6	+0.4301	0.5568	+0.2463	+65 -17		
6 G. Piscium	6.2	0.38	3.7	2 50.0	16	0 1.6	-3 12.0	+1.2241	0.5550	0.2478	+87 +33		
3 Piscium	6.3	0.39	4.3	0 15.2	1	6.1	-2 9.7	-1.0842	0.5547	0.2479	-22 -90		
22 B. Piscium	6.4	0.49	4.4	0 9.5	11	25.7	+7 48.7	+1.3785	0.5530	0.2472	+75 +56		
κ Piscium	4.9	0.51	4.8	+0 48.5	12	58.0	+9 17.8	+0.7932	0.5529	0.2468	+90 +3		
9 Piscium	6.4	+0.51	+4.7	+0 40.4	13	6.6	+9 26.0	+0.9632	0.5528	+0.2468	+90 +13		
16 Piscium	5.7	0.55	5.0	1 38.9	17	15.3	-10 33.7	+1.0088	0.5525	0.2456	+90 +17		
19 Piscium	5.4	0.60	5.5	3 2.0	21	47.0	-6 11.2	+0.7304	0.5522	0.2439	+90 0		
ω Piscium	4.0	0.66	6.6	6 24.7	17	3 37.7	-0 32.4	-1.2433	0.5521	0.2409	-36 -84		
36 Piscium	6.2	0.76	7.0	7 47.2	11	26.5	+7 0.4	-0.7664	0.5524	0.2358	-1 -82		
d Piscium	5.4	+0.78	+7.0	+7 44.2	13	15.7	+8 45.9	-0.2882	0.5525	+0.2344	+25 -55		
136 B. Piscium	6.5	0.90	7.4	8 54.6	22	33.1	-6 15.8	+0.6695	0.5535	0.2262	+87 -2		
75 Piscium	6.3	1.06	8.4	12 31.2	18	9 53.9	+4 41.5	-0.4892	0.5556	0.2137	+14 -65		
η Piscium	3.7	1.22	9.0	14 55.6	20	57.2	-8 38.3	-0.6573	0.5581	0.1990	+4 -74		
101 Piscium	6.2	1.24	8.7	14 14.7	22	51.1	-6 48.2	+0.4127	0.5586	0.1962	+65 -12		
105 Piscium	6.1	+1.27	+9.3	+15 59.6	19	0 33.6	-5 9.3	-1.0391	0.5591	+0.1937	-20 -74		
4 Arietis	5.8	1.33	9.4	16 33.0	4	17.6	-1 33.2	-0.8979	0.5601	0.1879	-11 -73		
i Arietis	5.1	1.39	9.5	17 25.2	8	18.1	+2 18.9	-1.0495	0.5612	0.1815	-22 -73		
35 B. Arietis	6.4	1.44	9.5	17 51.7	11	4.5	+4 59.4	-1.0070	0.5620	0.1768	-19 -72		
47 B. Arietis	6.5	1.46	9.4	17 38.5	12	50.5	+6 41.6	-0.4716	0.5625	0.1738	+14 -58		
20 H. Arietis	6.4	+1.47	+9.0	+16 50.6	13	32.8	+7 22.4	+0.4708	0.5627	+0.1726	+70 -7		
26 Arietis	6.2	1.63	9.4	19 29.7	22	43.3	-7 46.8	-0.7504	0.5654	0.1558	-2 -71		
μ Arietis	5.7	1.70	9.2	19 39.9	20	3 45.5	-2 55.5	-0.1669	0.5668	0.1461	+30 -38		
47 Arietis	5.8	1.81	8.9	20 20.6	10	27.5	+3 32.0	+0.0653	0.5686	0.1325	+44 -23		
ε Arietis (mean)	4.6	1.82	9.1	21 0.9	10	56.4	+3 59.9	-0.5676	0.5688	0.1315	+8 -61		
ζ Arietis	5.0	+1.92	+8.4	+20 44.6	17	36.3	+10 25.2	+0.5439	0.5704	+0.1173	+77 +4		
r Arietis	5.2	1.96	8.2	20 51.3	20	16.6	-11 0.3	+0.7351	0.5710	0.1115	+90 +15		
63 Arietis	5.2	1.97	8.0	20 27.1	20	55.8	-10 22.7	+1.2264	0.5712	0.1100	+88 +53		
65 Arietis	6.0	1.98	8.0	20 30.9	21	38.3	-9 41.6	+1.2378	0.5713	0.1085	+86 +54		
66 Arietis	6.1	2.03	8.4	22 31.5	23	18.3	-8 5.4	-0.6753	0.5717	0.1048	+2 -65		
23 Tauri	4.3	+2.16	+8.0	+23 41.8	21	6 48.8	-0 51.3	-1.1768	0.5730	+0.0877	-38 -66		
104 B. Tauri	5.5	2.16	7.8	23 10.3	7	40.2	-0 1.8	-0.5560	0.5732	0.0857	+8 -56		
27 Tauri	3.7	2.17	7.9	23 48.4	8	0.2	+0 17.4	-1.1894	0.5732	0.0849	+40 -66		
28 Tauri	5.2	2.18	7.9	23 53.4	8	0.7	+0 17.9	-1.2759	0.5732	0.0849	-57 -66		
133 B. Tauri	5.9	2.15	7.3	21 59.9	8	20.7	+0 37.2	+0.7289	0.5733	0.0842	+90 +18		
32 Tauri	5.8	+2.20	+7.0	+22 14.7	11	15.3	+3 25.2	+0.7064	0.5736	+0.0774	+90 +16		
33 Tauri	6.0	2.21	7.3	22 56.4	11	19.8	+3 29.6	-0.0157	0.5736	0.0772	+39 -22		
161 B. Tauri	6.5	2.23	7.1	22 58.4	12	57.5	+5 3.7	+0.0732	0.5738	0.0734	+44 -17		
36 Tauri	5.6	2.27	7.2	23 53.0	14	22.6	+6 25.7	-0.7789	0.5740	0.0700	-5 -66		
192 B. Tauri	6.1	2.29	6.3	22 12.3	17	57.3	+9 52.4	+1.2156	0.5743	0.0615	+88 +56		
62 Tauri	6.1	+2.38	+6.2	+24 6.8	22	35.5	-9 39.7	-0.5272	0.5745	+0.0504	+10 -51		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'n's from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
ν Tauri	4.2	+2.37	+ 5.7	+22 37.8	21 23 34.6	- 8 42.7	+1.0797	0.5745	+0.0480	+90	+44
72 Tauri	5.4	2.38	5.7	22 48.9	23 59.4	- 8 18.9	+0.9060	0.5746	0.0470	+90	+32
284 B. Tauri	6.0	2.43	5.3	23 10.5	22 3 49.8	- 4 37.1	+0.6896	0.5745	0.0377	+90	+19
τ Tauri	4.3	2.45	4.8	22 48.1	6 15.1	- 2 17.2	+1.1683	0.5745	0.0318	+90	+53
95 Tauri	6.2	2.48	5.1	23 56.2	6 38.8	- 1 54.3	-0.0147	0.5745	0.0309	+39	-18
300 B. Tauri	6.2	+2.48	+ 4.8	+23 28.8	7 41.5	- 0 53.9	+0.4971	0.5744	+0.0283	+74	+ 9
315 B. Tauri	6.3	2.55	4.5	24 27.8	12 6.3	+ 3 21.1	-0.4396	0.5741	0.0176	+15	-42
99 Tauri	6.0	2.55	4.2	23 49.4	12 45.8	+ 3 59.1	+0.2486	0.5740	0.0160	+55	- 3
k Tauri	5.6	2.57	4.5	24 55.6	12 53.5	+ 4 6.5	-0.9156	0.5740	0.0157	-15	-65
103 Tauri	5.5	2.60	3.7	24 9.5	17 5.3	+ 8 9.0	-0.0604	0.5735	+0.0055	+36	-18
118 Tauri	5.4	+2.72	+ 2.6	+25 5.2	23 2 0.8	- 7 15.2	-1.0925	0.5718	-0.0160	-30	-65
121 Tauri	5.1	2.72	1.9	23 59.2	4 39.1	- 4 42.6	+0.0245	0.5711	0.0223	+41	-15
394 B. Tauri	6.0	2.73	1.2	23 10.0	8 1.0	- 1 28.1	+0.8089	0.5702	0.0302	+90	+27
132 Tauri	5.0	2.78	1.1	24 32.5	10 25.6	+ 0 51.2	-0.7349	0.5695	0.0359	- 3	-65
412 B. Tauri	5.8	2.80	+ 0.5	24 14.3	13 49.5	+ 4 7.8	-0.5487	0.5684	0.0438	+ 9	-52
1 Geminorum	4.3	+2.80	- 0.2	+23 16.1	16 56.0	+ 7 7.6	+0.3395	0.5673	-0.0509	+62	- 1
3 Geminorum	5.6	2.82	0.5	23 7.7	19 21.7	+ 9 28.1	+0.3600	0.5664	0.0564	+63	- 1
5 Geminorum	5.9	2.85	0.4	24 26.4	20 7.4	+10 12.0	-1.0855	0.5661	0.0581	-29	-66
6 Geminorum	6.3	2.82	0.8	22 55.7	20 29.1	+10 33.1	+0.5092	0.5659	0.0590	+75	+ 7
η Gemin. (var.)	3.2	2.82	1.0	22 31.9	21 36.3	+11 37.8	+0.8662	0.5655	0.0615	+90	+28
8 Geminorum	6.1	+2.86	- 0.8	+23 59.8	22 12.2	-11 47.6	-0.7393	0.5652	-0.0628	- 3	-66
9 Geminorum	6.2	2.85	0.9	23 46.2	22 29.7	-11 30.6	-0.5140	0.5652	0.0634	+11	-51
μ Geminorum	3.2	2.84	1.6	22 33.4	24 1 7.2	- 8 58.6	+0.6107	0.5640	0.0692	+85	+11
36 B. Geminorum	6.0	2.87	1.6	23 22.4	2 14.4	- 7 53.8	-0.3434	0.5636	0.0717	-20	-40
d Geminorum	5.2	2.90	3.6	21 51.5	13 45.4	+ 3 13.0	+0.3171	0.5581	0.0959	+60	- 7
ζ Gemin. (var.)	3.7	+2.90	- 4.6	+20 41.4	19 24.9	+ 8 40.8	+1.0010	0.5552	-0.1071	+90	+32
44 Geminorum	5.9	2.94	4.4	22 45.6	19 55.4	+ 9 10.3	-1.2848	0.5549	0.1081	-56	-67
120 B. Geminorum	6.5	2.92	4.9	21 23.4	22 7.9	+11 18.2	-0.0508	0.5537	0.1123	+37	-28
56 Geminorum	5.2	2.92	5.8	20 35.9	25 3 32.6	- 7 28.1	+0.1689	0.5507	0.1224	+50	-17
149 B. Geminorum	6.4	2.94	6.0	21 41.9	5 47.3	- 5 17.8	-1.3014	0.5494	0.1265	-60	-68
61 Geminorum	5.8	+2.92	- 6.1	+20 25.2	5 50.4	- 5 14.8	+0.0745	0.5494	-0.1265	+44	-23
63 Geminorum	5.3	2.94	6.1	21 36.7	6 11.7	- 4 54.3	-1.2596	0.5492	0.1272	-47	-68
79 Geminorum	6.3	2.94	7.3	20 30.7	14 19.6	+ 2 57.5	-1.1619	0.5445	0.1411	-33	-70
g Geminorum	5.0	2.91	7.5	18 42.5	14 48.7	+ 3 25.6	+0.7246	0.5442	0.1419	+90	+10
209 B. Geminorum	6.2	2.92	7.8	19 32.0	17 32.8	+ 6 4.4	-0.5645	0.5426	0.1463	+ 9	-62
3 Cancr	5.7	+2.89	- 8.5	+17 31.9	21 46.9	+10 10.3	+0.9772	0.5400	-0.1528	+90	+25
10 H. Cancr	6.1	2.92	8.6	19 4.3	23 39.6	+11 59.3	-0.9873	0.5389	0.1556	-18	-71
ζ Cancr (mean)	4.7	2.90	9.2	17 53.6	26 3 16.0	- 8 31.2	-0.2762	0.5368	0.1609	+25	-46
d^2 Cancr	6.2	2.88	10.0	17 18.9	9 55.6	- 2 4.1	-0.7481	0.5329	0.1699	- 1	-73
90 B. Cancr	6.3	2.85	10.5	15 35.7	15 1.5	+ 2 52.3	+0.2459	0.5300	0.1764	+54	-20
54 Cancr	6.3	+2.84	-11.4	+15 39.1	22 29.2	+10 6.3	-1.1662	0.5258	-0.1850	-31	-74
209 B. Cancr	6.5	2.77	12.1	11 53.7	27 8 4.8	- 4 35.5	+1.1297	0.5207	0.1946	+90	+31
222 B. Cancr	6.3	2.76	12.5	11 50.5	12 15.3	- 0 32.4	+0.3692	0.5186	0.1984	+62	-16
ξ Leonis	5.1	2.73	13.1	11 39.6	19 36.6	+ 6 36.0	-0.9129	0.5151	0.2043	-11	-78
h Leonis	5.2	2.71	12.9	10 4.5	19 37.8	+ 6 37.2	-0.8280	0.5151	0.2043	+90	+ 9
o Leonis	3.8	+2.70	-13.3	+10 15.7	28 0 28.9	+11 20.0	-0.3784	0.5130	-0.2078	+20	-59
83 B. Leonis	5.9	2.66	13.8	9 19.1	8 37.9	- 4 45.0	-1.0527	0.5096	0.2127	-20	-81
89 B. Leonis	6.2	2.65	13.8	8 42.1	9 32.5	- 3 51.9	-0.5664	0.5093	0.2132	+10	-73
π Leonis	4.9	2.64	13.8	8 26.1	10 40.0	- 2 46.3	-0.5111	0.5089	0.2138	+13	-69
155 B. Leonis	6.5	2.56	14.2	6 6.4	23 10.4	+ 9 23.0	-0.6491	0.5049	0.2191	+ 5	-81
237 B. Leonis	6.3	+2.46	-14.1	+ 1 27.4	29 15 7.0	+ 0 53.1	+0.9763	0.5013	-0.2220	+90	+14

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Pa- nells	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>	
		$\Delta\alpha$	$\Delta\delta$									
		<i>s</i>	<i>"</i>	<i>"</i> <i>'</i>	<i>d</i> <i>h</i> <i>m</i>	<i>h</i> <i>m</i>				<i>°</i> <i>'</i>	<i>"</i>	
55 Leonis	6.1	+2.45	-14.0	+ 1 10.2	29 17 2.2	+ 2 45.2	+0.8656	0.5010	-0.2229	+90	+ 1	
<i>p</i> ³ Leonis	6.1	2.44	14.1	0 26.2	21 25.4	+ 7 1.1	+0.7010	0.5004	0.2231	+90	- 2	
<i>p</i> ⁵ Leonis	5.3	2.40	14.2	+ 0 22.4	30 3 3.1	-11 30.4	-0.4835	0.4999	0.2231	+14	- 70	
388 B. Leonis	6.3	2.34	13.9	- 1 15.1	10 54.2	- 3 52.1	-0.4292	0.4996	0.2224	+17	- 60	
<i>e</i> Leonis	5.1	2.34	13.6	2 33.3	12 14.9	- 2 33.7	+0.7178	0.4996	0.2222	+87	- 2	
431 B. Leonis	6.2	+2.31	-13.8	- 1 59.2	16 44.1	+ 1 48.2	-0.9081	0.4996	-0.2213	-10	- 90	
13 B. Virginis	5.9	2.26	13.1	4 52.8	23 44.2	+ 8 36.8	+0.7618	0.5002	0.2195	+85	+ 1	
64 B. Virginis	6.5	2.20	12.4	7 19.3	31 10 26.3	- 4 58.7	+1.1414	0.5016	0.2155	+83	+ 27	
<i>q</i> Virginis	5.3	+2.12	-11.8	- 9 0.2	23 10.0	+ 7 23.8	+0.3028	0.5046	-0.2088	+55	- 34	

FEBRUARY.

370 B. Virginis	6.0	+2.04	-10.9	-11 12.4	1 10 12.5	- 5 52.4	+0.4770	0.5082	-0.2015	+65 - 14
75 Virginis	5.6	1.90	9.0	14 56.6	2 6 23.9	-10 16.0	+0.7063	0.5171	0.1832	+75 - 1
83 Virginis	5.6	1.86	8.6	15 46.2	12 20.3	- 4 30.3	+0.5433	0.5202	0.1768	+65 - 10
85 Virginis	6.1	+1.85	- 8.7	-15 21.5	12 53.8	- 3 57.8	-0.0069	0.5206	-0.1762	+33 - 40
214 G. Virginis	6.5	1.77	8.1	15 56.8	22 45.2	+ 5 35.6	-1.0395	0.5262	0.1642	-28 - 90
43 H. Virginis	5.5	1.74	7.2	17 49.2	3 45.5	+10 26.6	+0.2055	0.5293	0.1576	+42 - 38
231 G. Virginis	6.4	1.73	7.0	18 12.4	4 34.1	+11 13.7	+0.4999	0.5298	0.1565	+59 - 12
236 G. Virginis	5.7	1.73	6.9	18 20.3	5 20.4	+11 58.6	+0.5232	0.5303	0.1554	+61 - 11
9 G. Libræ	6.5	+1.66	- 5.9	-20 4.9	13 9.8	- 4 26.9	+1.2476	0.5354	-0.1441	+70 + 44
17 G. Libræ	6.4	1.62	5.4	20 49.8	18 35.4	+ 0 46.2	+1.3035	0.5390	0.1357	+68 + 58
43 B. Libræ	5.7	1.57	5.2	21 2.9	23 48.4	+ 5 51.0	+0.8471	0.5425	0.1271	+69 + 9
47 G. Libræ	6.1	1.53	4.6	21 42.9	4 4 0.9	+ 9 55.3	+1.0459	0.5455	0.1198	+68 + 24
64 G. Libræ	5.8	1.49	4.2	22 5.9	8 34.5	- 9 40.4	+0.9290	0.5486	0.1116	+68 + 15
169 B. Libræ	6.0	+1.39	- 3.4	-22 52.3	18 13.7	- 0 20.9	+0.7658	0.5553	-0.0932	+67 + 4
177 B. Libræ	6.2	1.39	- 3.4	-22 53.0	18 55.3	+ 0 19.2	+0.7148	0.5558	0.0918	+67 + 1
32 B. Scorpii	5.3	1.32	2.7	23 44.1	5 1 20.8	+ 6 31.2	+1.0737	0.5601	0.0786	+66 + 27
6 Scorpii	2.5	1.28	3.0	22 23.4	4 9.9	+ 9 14.4	-0.5740	0.5620	0.0727	- 9 - 81
57 B. Scorpii	5.7	1.26	2.5	23 23.0	6 39.6	+11 38.8	+0.3096	0.5635	0.0673	+38 - 22
24 G. Scorpii	6.2	+1.26	- 2.2	-24 14.7	7 24.5	-11 38.0	+1.1741	0.5640	-0.0657	+66 + 38
27 G. Scorpii	5.8	1.25	2.4	23 28.1	7 47.6	-11 15.7	+0.3236	0.5643	0.0648	+39 - 22
41 G. Scorpii	6.3	1.23	2.1	24 12.8	9 57.0	- 9 10.9	+0.9803	0.5656	0.0601	+66 + 20
19 Scorpii	4.9	1.20	2.0	23 58.4	12 54.2	- 6 20.1	+0.5559	0.5675	0.0535	+53 - 8
p Ophiuchi	4.7	1.17	2.1	23 15.6	15 1.5	- 4 17.4	-0.3083	0.5687	0.0486	+ 3 - 59
126 B. Scorpii	6.1	+1.10	- 1.4	-24 18.6	21 47.1	+ 2 13.4	+0.5250	0.5727	-0.0328	+49 - 10
24 Ophiuchi	5.5	1.02	1.5	23 1.3	6 4 9.1	+ 8 21.1	-0.9889	0.5760	0.0176	-40 - 90
88 B. Ophiuchi	6.3	1.02	0.8	24 58.1	5 26.0	+ 9 35.1	+1.0318	0.5766	0.0144	+65 + 24
26 Ophiuchi	5.8	1.02	0.8	24 51.9	5 30.8	+ 9 39.7	+0.9219	0.5767	0.0142	+65 + 16
137 B. Ophiuchi	6.3	0.97	0.4	25 9.3	10 30.0	- 9 32.3	+1.1813	0.5790	-0.0019	+65 + 40
39 Ophiuchi	5.1	+0.94	- 0.6	-24 11.9	12 53.4	- 7 14.3	+0.1851	0.5801	+0.0041	+25 - 29
0 Ophiuchi	3.4	0.92	0.3	24 55.1	14 30.8	- 5 40.6	+0.9449	0.5808	0.0082	+65 + 17
191 B. Ophiuchi	6.3	0.91	0.5	24 10.2	15 47.4	- 4 26.9	+0.1769	0.5813	0.0114	+25 - 30
b Ophiuchi	6.3	0.90	0.5	24 6.1	16 18.5	- 3 57.0	+0.1120	0.5815	0.0127	+22 - 33
51 Ophiuchi	4.8	0.88	- 0.5	23 54.0	18 22.2	- 1 58.0	-0.0653	0.5823	0.0179	+13 - 44
63 Ophiuchi	6.1	+0.78	+ 0.2	-24 52.3	7 3 52.5	+ 7 10.4	+1.2226	0.5853	+0.0423	+65 + 46
4 Sagittarii	4.8	0.76	0.0	23 48.6	5 51.8	+ 9 5.2	+0.2156	0.5858	0.0474	+31 - 28
21 G. Sagittarii	5.7	0.74	- 0.2	22 46.8	6 43.8	+ 9 55.1	-0.8035	0.5860	0.0496	+25 - 90
7 Sagittarii	5.5	0.75	+ 0.2	24 17.0	7 5.3	+10 15.9	+0.7622	0.5861	0.0506	+66 + 4
9 Sagittarii	6.0	0.75	0.2	24 21.8	7 29.9	+10 39.4	+0.8661	0.5861	0.0516	+66 + 11
1 Sagittarii	5.2	+0.71	+ 0.2	-23 43.1	10 39.8	-10 17.9	+0.3784	0.5868	+0.0597	+41 - 18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y'</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				'	'
3. Sagittarii	5.7	+0.60	+0.1	21 28.0	7 21 11.7	- 0 10.6	-1.1529	0.5882	+0.0866	-47	-90
3. Sagittarii	5.8	0.61	0.6	23 34.5	21 24.4	+ 0 1.6	+1.0160	0.5882	0.0871	+66	+22
3. Sagittarii	6.3	0.57	0.1	21 5.2	8 0 9.8	+ 2 40.5	-1.2707	0.5884	0.0940	-61	-78
Sagittarii	5.6	0.58	0.5	22 28.7	0 33.4	+ 3 3.2	+0.1842	0.5884	0.0950	+33	-29
Sagittarii	6.2	0.56	0.5	22 15.4	2 21.7	+ 4 47.3	+0.1338	0.5884	0.0995	+31	-32
Sagittarii	5.8	+0.55	+0.4	21 27.7	3 38.3	+ 6 0.9	-0.5454	0.5885	+0.1027	-5	-78
Sagittarii	5.0	0.55	0.6	22 50.8	3 41.1	+ 6 3.6	+0.8666	0.5885	0.1028	+67	+11
Sagittarii	5.1	0.55	0.6	22 46.5	4 3.7	+ 6 25.3	+0.8321	0.5885	0.1037	+67	+ 8
Sagittarii	5.1	0.53	0.2	20 45.9	4 59.1	+ 7 18.5	-1.1112	0.5884	0.1060	-41	-90
Sagittarii	3.7	0.53	0.3	21 12.9	5 8.0	+ 7 27.1	-0.6379	0.5884	0.1063	-10	-88
B. Sagittarii	6.3	+0.53	+0.7	-22 48.7	6 40.4	+ 8 55.9	+1.1471	0.5884	+0.1101	+67	+34
Sagittarii	3.9	0.52	0.5	21 51.8	7 54.4	+10 7.0	+0.3227	0.5884	0.1131	+43	-22
Sagittarii	3.0	0.50	0.5	21 9.3	9 57.3	-11 54.9	-0.1567	0.5883	0.1181	+17	-49
B. Sagittarii	6.4	0.48	0.6	21 47.7	11 1.7	-10 53.0	+0.6188	0.5882	0.1207	+63	- 5
B. Sagittarii	6.1	0.44	0.8	21 29.0	18 26.2	- 3 45.7	+1.2590	0.5875	0.1380	+69	+47
B. Sagittarii	6.1	+0.41	+0.5	-19 2.1	20 41.7	- 1 35.5	-0.8862	0.5871	+0.1432	-21	-90
NEW MOON.											
Piscium	5.7	+0.39	+3.4	+ 1 38.9	13 1 56.1	- 0 5.0	+0.8561	0.5640	+0.2492	+90	+ 7
Piscium	5.4	0.42	3.7	3 2.0	6 17.8	+ 4 7.4	+0.5758	0.5638	0.2476	+77	- 9
Piscium	4.0	+0.46	+4.5	+ 6 24.6	11 55.4	+ 9 33.1	-1.3719	0.5638	+0.2447	-56	-75
Piscium	6.2	0.52	4.9	7 47.2	19 26.7	- 7 11.7	-0.9128	0.5640	0.2395	-10	-82
Piscium	5.4	0.54	4.9	7 44.2	21 11.9	- 5 30.2	-0.4449	0.5641	0.2381	+16	-65
B. Piscium	6.5	0.62	5.3	8 54.6	14 6 8.9	+ 3 7.7	+0.4864	0.5648	0.2297	+70	-12
Piscium	6.3	0.74	6.2	12 31.1	17 5.7	-10 19.0	-0.6630	0.5661	0.2169	+ 4	-76
Piscium	3.7	+0.87	+6.9	+14 55.5	15 3 47.1	- 0 0.7	-0.8366	0.5679	+0.2018	- 7	-75
Piscium	6.2	0.89	6.6	14 14.7	5 37.6	+ 1 45.8	+0.2159	0.5682	0.1989	+52	-22
Piscium	6.1	0.92	7.2	15 59.5	7 16.8	+ 3 21.4	-1.2148	0.5684	0.1963	-36	-74
Arietis	5.8	0.96	7.2	16 33.0	10 54.2	+ 6 50.9	-1.0779	0.5691	0.1904	-24	-73
Arietis	5.1	1.02	7.4	17 25.2	14 47.7	+10 35.9	-1.2295	0.5698	0.1837	-39	-73
B. Arietis	6.4	+1.06	+7.5	+17 51.7	17 29.5	-10 48.1	-1.1890	0.5703	+0.1790	-35	-72
B. Arietis	6.5	1.08	7.4	17 38.5	19 12.7	- 9 8.7	-0.6617	0.5706	0.1759	+ 3	-71
H. Arietis	6.4	1.09	7.1	16 50.5	19 53.8	- 8 29.1	+0.2675	0.5707	0.1746	+56	-17
Arietis	6.2	1.23	7.7	19 29.7	16 4 50.6	+ 0 8.0	-0.9400	0.5723	0.1575	-15	-71
Arietis	6.4	1.22	6.9	17 20.6	4 58.6	+ 0 15.7	+1.2701	0.5724	0.1572	+85	+53
Arietis	5.7	+1.30	+7.5	+19 39.9	9 46.1	+ 4 52.6	-0.3645	0.5731	+0.1475	+20	-49
Arietis	5.8	1.41	7.4	20 20.6	16 20.0	+11 12.0	-0.1350	0.5741	0.1337	+32	-34
Arietis (<i>mean</i>)	4.6	1.42	7.6	21 0.9	16 48.4	+11 39.4	-0.7612	0.5741	0.1327	- 3	-69
Arietis	5.0	1.52	7.1	20 44.6	23 21.4	- 6 2.3	+0.3397	0.5749	0.1183	+61	- 8
Arietis	5.2	1.56	7.0	20 51.2	17 1 59.3	- 3 30.3	+0.5298	0.5751	0.1124	+76	+ 3
Arietis	5.2	+1.56	+6.8	+20 27.1	2 37.9	- 2 53.2	+1.0168	0.5752	+0.1110	+90	+33
Arietis	6.0	1.57	6.7	20 30.9	3 19.8	- 2 12.8	+1.0284	0.5752	0.1094	+90	+34
Arietis	6.1	1.62	7.3	22 31.5	4 58.4	- 0 37.9	-0.8675	0.5753	0.1056	-11	-67
3. Tauri	5.5	1.75	6.9	23 10.3	13 14.3	+ 7 19.6	-0.7477	0.5757	0.0864	- 3	-67
3. Tauri	5.9	1.75	6.3	21 59.8	13 54.4	+ 7 58.2	+0.5282	0.5757	0.0848	+76	+ 6
Tauri	5.8	+1.80	+6.2	+22 14.7	16 47.4	+10 44.8	+0.5072	0.5757	+0.0780	+74	+ 5
Tauri	6.0	1.81	6.5	22 56.4	16 51.9	+10 49.1	-0.2101	0.5757	0.0778	+28	-33
3. Tauri	6.5	1.83	6.3	22 58.3	18 28.7	-11 37.8	-0.1211	0.5757	0.0740	+33	-28
Tauri	5.6	1.87	6.5	23 53.0	19 53.1	-10 16.5	-0.9673	0.5756	0.0707	-19	-66
Tauri	4.5	1.85	5.8	21 51.6	20 2.8	-10 7.2	+1.1498	0.5756	0.0702	-90	+48
Tauri	6.1	+1.84	+5.7	+21 47.4	20 18.7	- 9 51.9	+1.2417	0.5756	+0.0696	+83	+50

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.				
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'
		$\Delta\alpha$	$\Delta\delta$						
		s	$''$	$''$	d	h	m		
128 B. Sagittarii	6.3	+1.36	+0.5	-21 5.1	7	9 50.2	- 9 51.0	-1.0761	0.5784 +0.091
28 Sagittarii	5.6	1.37	1.0	22 28.7		10 14.6	- 9 27.6	+0.3981	0.5784 0.092
30 Sagittarii	6.2	1.34	1.0	22 15.4		12 6.4	- 7 39.9	+0.3444	0.5785 0.096
33 Sagittarii	5.8	1.32	0.9	21 27.7		13 25.4	- 6 23.9	-0.3459	0.5786 0.095
ν^1 Sagittarii	5.0	1.33	1.4	22 50.8		13 28.4	- 6 21.0	+1.0852	0.5786 0.095
ν^2 Sagittarii	5.1	+1.33	+1.4	-22 46.5		13 51.7	- 5 58.6	+1.0495	0.5786 +0.100
36 Sagittarii	5.1	1.29	0.8	20 45.9		14 48.8	- 5 3.7	-0.9213	0.5786 0.102
ξ Sagittarii	3.7	1.30	1.0	21 12.9		14 58.0	- 4 54.8	-0.4419	0.5786 0.103
o Sagittarii	3.9	1.27	1.4	21 51.7		17 49.7	- 2 9.6	+0.5274	0.5787 0.105
π Sagittarii	3.0	1.24	1.3	21 9.3		19 56.5	- 0 7.5	+0.0384	0.5787 0.114
195 B. Sagittarii	6.3	+1.22	+0.9	-19 56.0		19 58.4	- 0 5.7	-1.2091	0.5787 +0.114
199 B. Sagittarii	6.4	1.23	1.6	21 47.7		21 2.8	+ 0 56.2	+0.8223	0.5787 0.117
226 B. Sagittarii	6.4	1.16	1.1	19 23.3	8	0 52.0	+ 4 36.8	-1.1745	0.5786 0.125
266 B. Sagittarii	6.1	1.09	1.5	19 2.1		7 0.1	+10 31.0	-0.7180	0.5784 0.139
f Sagittarii	5.1	1.05	2.0	19 57.5		11 6.6	- 9 31.7	+0.8106	0.5781 0.148
57 Sagittarii	6.0	+1.02	+1.9	-19 15.2		13 32.3	- 7 11.5	+0.4605	0.5778 +0.153
31 B. Capricorni	6.4	0.85	2.0	16 0.8	9	4 47.9	+ 7 30.1	-0.2387	0.5760 0.182
27 G. Capricorni	6.2	0.83	1.8	15 19.9		5 47.3	+ 8 27.3	-0.7402	0.5759 0.184
47 B. Capricorni	6.2	0.82	2.3	16 48.5		7 38.2	+10 14.1	+1.0827	0.5756 0.187
r Capricorni	5.2	0.80	2.0	15 14.6		9 13.4	+11 45.7	-0.1837	0.5754 0.190
61 B. Capricorni	5.9	+0.80	+2.4	-16 25.0		9 44.8	-11 44.1	+1.0893	0.5753 +0.191
95 B. Capricorni	5.9	0.73	2.3	14 48.0		17 23.9	- 4 21.9	+0.9850	0.5741 0.203
ν Aquarii	4.5	0.68	1.9	11 42.2		22 1.3	+ 0 5.3	-1.1349	0.5735 0.210
53 B. Aquarii	6.5	0.67	2.4	13 32.5	10	0 42.8	+ 2 40.8	+1.2615	0.5731 0.214
19 Aquarii	5.6	0.62	1.9	10 5.9		4 39.2	+ 6 28.6	-1.2957	0.5726 0.219
72 B. Aquarii	6.5	+0.63	+2.3	-11 55.4		5 54.8	+ 7 41.4	+0.7889	0.5724 +0.221
NEW MOON.									
η Piscium	3.7	+0.62	+4.8	+14 55.5	14	13 13.0	+11 13.3	-1.0172	0.5794 +0.203
101 Piscium	6.2	0.64	4.8	14 14.6		14 59.6	-11 4.1	+0.0150	0.5798 0.201
4 Arietis	5.8	+0.68	+5.1	+16 33.0		20 5.0	- 6 10.2	-1.2666	0.5809 +0.192
47 B. Arietis	6.5	0.76	5.3	17 38.4	15	4 5.7	+ 1 32.2	-0.8701	0.5825 0.177
20 H ¹ Arietis	6.4	0.77	5.0	16 50.5		4 45.4	+ 2 10.4	+0.0424	0.5826 0.176
26 Arietis	6.2	0.88	5.6	19 29.6		13 22.9	+10 28.1	-1.1568	0.5842 0.159
27 Arietis	6.4	0.86	5.0	17 20.6		13 30.6	+10 35.5	+1.0153	0.5842 0.159
u Arietis	5.7	+0.92	+5.5	+19 39.9		18 7.8	- 8 57.9	-0.5972	0.5849 +0.149
47 Arietis	5.8	1.01	5.5	20 20.5	16	0 27.9	- 2 52.3	-0.3789	0.5856 0.135
ϵ Arietis (mean)	4.6	1.01	5.6	21 0.9		0 55.3	- 2 25.9	-0.9949	0.5856 0.134
δ Arietis	4.5	1.07	5.0	19 25.1		5 56.2	+ 2 23.3	+1.2604	0.5859 0.122
ζ Arietis	5.0	1.09	5.3	20 44.6		7 14.8	+ 3 38.9	+0.0811	0.5860 0.119
r Arietis	5.2	+1.12	+5.2	+20 51.2		9 47.4	+ 6 5.6	+0.2658	0.5861 +0.113
63 Arietis	5.2	1.13	5.1	20 27.1		10 24.7	+ 6 41.4	+0.7442	0.5861 0.112
65 Arietis	6.0	1.14	5.0	20 30.9		11 5.2	+ 7 20.4	+0.7551	0.5861 0.110
66 Arietis	6.1	1.17	5.5	22 31.4		12 40.5	+ 8 52.0	-1.1108	0.5861 0.106
14 H ¹ Tauri	6.5	1.22	4.8	20 39.0		16 56.8	-11 1.7	+1.2276	0.5860 0.096
104 B. Tauri	5.5	+1.29	+5.3	+23 10.3		20 40.5	- 7 26.5	-0.9991	0.5858 +0.087
133 B. Tauri	5.9	1.29	4.9	21 59.8		21 19.4	- 6 49.1	+0.2561	0.5858 0.085
32 Tauri	5.8	1.33	4.8	22 14.6	17	0 7.1	- 4 7.9	+0.2338	0.5855 0.078
33 Tauri	6.0	1.34	5.0	22 56.4		0 11.5	- 4 3.7	-0.4723	0.5855 0.078
161 B. Tauri	6.5	1.36	4.9	22 58.3		1 45.4	- 2 33.4	-0.3856	0.5853 0.074
36 Tauri	5.6	+1.39	+5.1	+23 53.0		3 7.2	- 1 14.8	-1.2196	0.5851 +0.071

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
A Tauri	4.5	+1.37	+4.4	+21 51.6	17 3 16.7	-1 5.7	+0.8649	0.5851	+0.0710	+90	+27
39 Tauri	6.1	1.38	4.4	21 47.4	3 32.1	-0 50.8	+0.9553	0.5851	0.0703	+90	+33
192 B. Tauri	6.1	1.42	4.3	22 12.3	6 34.3	+2 4.4	+0.7331	0.5846	0.0627	+90	+20
62 Tauri	6.1	1.50	4.6	24 6.7	11 3.3	+6 23.0	-0.9741	0.5838	0.0515	-20	-66
κ Tauri	4.1	1.49	3.9	22 6.5	11 38.1	+6 56.5	+1.1210	0.5837	0.0500	+90	+47
67 Tauri	5.4	+1.49	+3.9	+22 0.9	11 39.3	+6 57.6	+1.2188	0.5837	+0.0500	+87	+58
ν Tauri	4.2	1.50	4.0	22 37.8	12 0.5	+7 18.1	+0.6021	0.5836	0.0491	+84	+13
72 Tauri	5.4	1.51	4.1	22 48.8	12 24.5	+7 41.1	+0.4319	0.5835	0.0481	+68	+4
234 B. Tauri	6.0	1.57	3.8	23 10.5	16 8.1	+11 16.2	-0.2212	0.5826	0.0387	+53	-6
τ Tauri	4.3	1.60	3.5	22 48.1	18 29.4	-10 27.9	+0.6928	0.5820	0.0328	+90	+20
95 Tauri	6.2	+1.62	+3.9	+23 56.1	18 52.4	-10 5.8	-0.4695	0.5819	+0.0319	+13	-45
300 B. Tauri	6.2	1.63	3.6	23 28.8	19 53.5	-9 7.0	+0.0340	0.5816	0.0293	+42	-15
315 B. Tauri	6.3	1.70	3.6	24 27.8	0 11.8	-4 58.6	-0.8852	0.5803	0.0186	-13	-66
99 Tauri	6.0	1.70	3.3	23 49.3	0 50.5	-4 21.4	-0.2076	0.5801	0.0170	+28	-28
103 Tauri	5.5	1.76	3.0	24 9.5	5 4.4	-0 16.9	-0.5091	0.5786	+0.0065	+10	-46
121 Tauri	5.1	+1.92	+1.7	+23 59.2	16 26.8	+10 39.9	-0.4155	0.5738	-0.0210	+16	-41
175 H¹. Tauri	6.5	1.94	1.0	22 37.3	19 15.0	-10 38.0	+0.9533	0.5725	0.0276	+90	+37
394 B. Tauri	6.0	1.96	1.1	23 10.0	19 46.3	-10 8.0	+0.3642	0.5723	0.0289	+63	+2
132 Tauri	5.0	2.01	1.3	24 32.5	22 9.4	-7 50.2	-1.1609	0.5711	0.0344	-38	-65
412 B. Tauri	5.8	2.05	+0.8	24 14.3	19 131.6	-4 35.2	-0.9728	0.5694	0.0422	-20	-66
141 Tauri	6.3	+2.05	-0.1	+22 24.0	3 35.2	-2 36.1	+0.8804	0.5682	-0.0468	+90	+30
1 Geminorum	4.3	2.08	+0.1	23 16.1	4 36.8	-1 36.7	-0.0884	0.5676	0.0492	+34	-24
14 B. Geminorum	6.0	2.09	-0.5	22 12.2	6 57.6	+0 39.0	+0.9192	0.5664	0.0544	+90	+32
3 Geminorum	5.6	2.11	0.2	23 7.7	7 1.6	+0 42.8	-0.0644	0.5664	0.0545	+36	-23
6 Geminorum	6.3	2.12	0.4	22 55.7	8 8.7	+1 47.5	+0.0854	0.5658	0.0570	+45	-15
η Gemin. (var.)	3.2	+2.12	-0.7	+22 31.9	9 15.6	+2 52.0	+0.4416	0.5652	-0.0594	+69	+3
8 Geminorum	6.1	2.16	0.2	23 59.8	9 51.5	+3 26.7	-1.1514	0.5648	0.0607	-36	-66
9 Geminorum	6.2	2.16	0.3	23 46.2	10 8.8	+3 43.4	-0.9273	0.5646	0.0614	-16	-66
μ Geminorum	3.2	2.17	1.1	22 33.4	12 45.9	+6 14.9	+0.1939	0.5632	0.0670	+51	-11
36 B. Geminorum	6.0	2.20	0.9	23 22.4	13 53.0	+7 19.6	-0.7523	0.5625	0.0694	-4	-67
d Geminorum	5.2	+2.31	-2.9	+21 51.5	20 1 24.7	-5 33.0	-0.0740	0.5556	-0.0930	+35	-27
ζ Gemin. (var.)	3.7	2.36	4.0	20 41.4	7 5.7	-0 3.6	+0.6203	0.5520	0.1039	+85	+8
120 B. Geminorum	6.5	2.39	4.2	21 23.4	9 49.6	+2 34.7	-0.4226	0.5503	0.1090	+16	-49
56 Geminorum	5.2	2.44	5.0	20 35.9	15 16.6	+7 50.7	-0.1906	0.5469	0.1187	+29	-37
61 Geminorum	5.8	2.46	5.3	20 25.3	17 35.6	+10 5.2	-0.2791	0.5455	0.1227	+24	-42
g Geminorum	5.0	+2.52	-7.0	+18 42.6	21 2 38.9	-5 9.3	+0.3951	0.5398	-0.1376	+64	-8
209 B. Geminorum	6.2	2.56	7.0	19 32.0	5 24.8	-2 28.8	-0.8869	0.5381	0.1418	-12	-70
3 Cancri	5.7	2.56	8.2	17 31.9	9 41.6	+1 39.9	-0.6689	0.5356	0.1482	+90	+6
10 H. Cancri	6.1	2.60	7.9	19 4.3	11 35.6	+3 30.2	-1.2925	0.5344	0.1509	-52	-71
ζ Cancri (mean)	4.7	2.62	8.7	17 53.6	15 14.5	+7 2.2	-0.5692	0.5323	0.1560	+8	-64
d² Cancri	6.2	+2.66	-9.6	+17 18.9	21 58.9	-10 25.9	-1.0205	0.5284	-0.1649	-20	-73
90 B. Cancri	6.3	2.67	10.6	15 35.7	22 3 8.5	-5 25.9	-0.0065	0.5256	0.1711	+39	-33
209 B. Cancri	6.5	2.74	13.3	11 53.7	20 23.8	+11 18.5	+0.9443	0.5172	0.1892	+90	+17
222 B. Cancri	6.3	2.77	13.7	11 50.5	23 0 36.9	-8 35.8	+0.1979	0.5154	0.1930	+51	-25
ϵ Leonis	5.1	2.80	14.4	11 39.6	8 2.6	-1 23.0	-1.0583	0.5124	0.1990	-21	-78
h Leonis	5.2	+2.79	-14.7	+10 4.4	8 3.8	-1 21.8	+0.6888	0.5124	-0.1990	+89	0
o Leonis	3.8	2.82	15.1	10 15.7	12 57.4	+3 23.4	-0.5014	0.5107	0.2025	+13	-67
83 B. Leonis	5.9	2.85	15.9	9 19.1	21 10.1	+11 22.2	-1.1424	0.5081	0.2076	-28	-81
89 B. Leonis	6.2	2.85	16.1	8 42.1	22 5.0	-11 44.4	-0.6503	0.5078	0.2081	+5	-79
κ Leonis	4.9	2.85	16.2	8 26.0	23 13.0	-10 38.4	-0.5899	0.5075	0.2087	+8	-75
14 Sextantis	6.3	+2.84	-16.9	+6 0.4	24 2 48.2	-7 9.3	+1.3467	0.5066	-0.2106	+80	+54

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Pa- ra- llels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	"	d h m	h m				"	"
155 B. Leonis	6.5	+2.88	-17.4	+ 6 6.3	24 11 47.1	+ 1 34.6	-0.6718	0.5046	-0.2144	+ 3	-51
237 B. Leonis	6.3	2.92	18.8	1 27.3	25 3 45.4	+ 6 53.6	+1.0314	0.5026	0.2186	+90	+11
55 Leonis	6.1	2.92	18.9	1 10.1	5 40.6	- 5 1.5	+0.9292	0.5024	0.2189	+90	+11
p ^a Leonis	6.1	2.93	19.1	0 26.1	10 3.5	+ 0 45.9	+0.7843	0.5023	0.2193	+90	+11
p ^b Leonis	5.3	2.95	19.2	+ 0 22.3	15 40.6	+ 4 42.1	-0.3772	0.5022	0.2195	+19	-62
388 B. Leonis	6.3	+2.96	-19.5	- 1 15.2	23 30.4	-11 41.0	-0.2871	0.5024	-0.2191	+24	-56
e Leonis	5.1	2.97	19.6	2 33.4	26 0 50.7	-10 22.9	+0.8684	0.5025	0.2189	+87	+8
431 B. Leonis	6.2	2.98	19.6	1 59.3	5 18.8	- 6 2.1	-0.7408	0.5029	0.2183	0	-90
13 B. Virginis	5.9	3.00	19.7	4 53.0	12 17.0	+ 0 44.6	+0.9632	0.5038	0.2167	+85	+11
78 B. Virginis	6.5	3.02	19.6	5 16.1	27 1 0.5	-10 53.0	-1.3373	0.5062	0.2120	-51	-83
g Virginis	5.3	+3.05	-19.4	- 9 0.3	11 35.1	- 0 36.2	+0.6002	0.5089	-0.2065	+75	-7
370 B. Virginis	6.0	3.07	18.9	11 12.6	22 34.4	+10 4.4	+0.8167	0.5124	0.1991	+79	+5
i Virginis	5.7	3.08	17.9	12 17.2	28 15 34.3	+ 2 34.9	-1.2530	0.5190	0.1842	-44	-90
75 Virginis	5.6	3.11	17.4	14 56.8	18 43.3	+ 5 38.3	+1.1150	0.5204	0.1810	+75	+27
83 Virginis	5.6	3.11	16.8	15 46.3	29 0 40.2	+11 24.5	+0.9689	0.5230	0.1745	+74	+16
85 Virginis	6.1	+3.11	-16.9	-15 21.6	1 13.8	+11 57.1	+0.4170	0.5233	-0.1739	+57	-17
214 G. Virginis	6.5	3.10	16.0	15 56.9	11 7.8	- 2 26.9	-0.5972	0.5280	0.1618	0	-81
40 H. Virginis	5.1	3.10	15.7	15 55.2	13 55.5	+ 0 15.7	-1.0757	0.5293	0.1582	-31	-90
43 H. Virginis	5.5	3.12	15.2	17 49.4	16 10.3	+ 2 26.4	+0.6692	0.5304	0.1552	+71	-2
231 G. Virginis	6.4	3.12	15.0	18 12.5	16 59.2	+ 3 13.7	+0.9679	0.5308	0.1540	+72	+17
236 G. Virginis	5.7	+3.12	-15.0	-18 20.4	17 46.0	+ 3 59.0	+0.9933	0.5312	-0.1530	+72	+19
i Libræ	4.7	3.06	11.9	19 29.1	30 19 31.4	+ 4 55.4	-1.1876	0.5441	0.1124	-47	-90
147 B. Libræ	6.2	3.03	10.5	20 27.0	31 4 4.1	-10 48.9	-1.0271	0.5483	0.0970	-35	-90
172 B. Libræ	5.9	3.02	10.0	20 44.9	7 35.4	- 7 24.7	-1.0308	0.5500	0.0903	-36	-90
177 B. Libræ	6.2	3.06	9.4	22 53.1	8 3.8	- 6 57.3	+1.2528	0.5502	0.0894	+67	+50
δ Scorpïi	2.5	+2.98	- 8.2	-22 23.5	17 36.6	+ 2 16.2	-0.0503	0.5544	-0.0706	+18	-42
57 B. Scorpïi	5.7	2.99	7.5	23 23.1	20 11.7	+ 4 45.9	+0.8510	0.5556	0.0653	+67	+11
27 G. Scorpïi	5.8	+2.98	- 7.3	-23 28.2	21 22.3	+ 5 54.1	+0.8659	0.5560	-0.0629	+67	+12

APRIL.

19 Scorpïi	4.9	+2.95	- 6.4	-23 58.5	1 2 40.9	+11 1.7	+1.1055	0.5581	-0.0518	+66+31	
p Ophiuchi	4.7	2.92	6.4	23 15.6	4 53.5	-10 50.3	+0.2246	0.5590	0.0471	+31-26	
126 B. Scorpïi	6.1	2.88	5.0	24 18.7	11 57.1	- 4 1.5	+1.0768	0.5615	0.0318	+66+29	
24 Ophiuchi	5.5	2.79	4.4	23 1.4	18 37.4	+ 2 24.7	-0.4718	0.5635	-0.0170	- 9-71	
39 Ophiuchi	5.1	+2.72	- 2.6	-24 12.0	2 3 49.0	+11 16.6	+0.7269	0.5660	+0.0038	+66+3	
191 B. Ophiuchi	6.3	2.69	2.2	24 10.2	6 52.6	- 9 46.3	+0.7171	0.5666	0.0108	+65+2	
b Ophiuchi	4.3	2.68	2.2	24 6.1	7 25.5	- 9 14.6	+0.6502	0.5668	0.0121	+58-2	
51 Ophiuchi	4.8	2.65	1.9	23 54.0	9 36.1	- 7 8.8	+0.4671	0.5672	0.0171	+44-13	
4 Sagittarii	4.8	2.51	0.2	23 48.6	21 46.5	+ 4 35.4	+0.7453	0.5690	0.0451	+66+4	
21 G. Sagittarii	5.7	+2.48	- 0.4	-22 46.8	22 41.8	+ 5 28.6	-0.3025	0.5691	+0.0473	+ 4-58	
1 Sagittarii	5.2	2.45	+ 0.5	23 43.1	3 2 52.5	+ 9 30.2	+0.9069	0.5694	0.0568	+66+15	
14 Sagittarii	5.6	2.40	0.0	21 44.2	3 59.6	+10 34.9	-1.1203	0.5695	0.0594	-46-90	
115 B. Sagittarii	5.7	2.26	1.2	21 28.0	14 4.9	- 3 41.8	-0.6834	0.5698	0.0823	-15-90	
121 B. Sagittarii	5.9	2.25	1.1	21 7.2	14 30.6	- 3 17.0	-1.0109	0.5698	0.0832	-35-90	
128 B. Sagittarii	6.3	+2.22	+ 1.5	-21 5.1	17 14.7	- 0 39.0	-0.8099	0.5698	+0.0893	-21-90	
28 Sagittarii	5.6	2.23	2.0	22 28.7	17 39.8	- 0 14.7	+0.6857	0.5698	0.0903	+66 0	
30 Sagittarii	6.2	2.20	2.2	22 15.4	19 35.2	+ 1 36.5	+0.6304	0.5698	0.0945	+62-4	
33 Sagittarii	5.8	2.17	2.1	21 27.6	20 56.8	+ 2 55.1	-0.0708	0.5698	0.0975	+20-44	
36 Sagittarii	5.1	2.14	2.0	20 45.8	22 22.9	+ 4 18.1	-0.6555	0.5697	0.1007	-11-89	
ε Sagittarii	3.7	+2.15	+ 2.2	-21 12.9	22 32.4	+ 4 27.2	-0.1690	0.5696	+0.1010	+15-49	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Par- allels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		s	"	'	d	h	m				'		
Sagittarii	3.9	+2.12	+2.8	-21 51.7	4	1 29.8	+ 7 18.2	+0.8133	0.5695	+0.1074	+68 + 8		
Sagittarii	3.0	2.08	2.8	21 9.3		3 40.8	+ 9 24.5	+0.3155	0.5694	0.1121	+43 -22		
B. Sagittarii	6.3	2.06	2.4	19 56.0		3 42.9	+ 9 26.5	-0.9512	0.5694	0.1122	-28 -90		
B. Sagittarii	6.4	2.07	3.2	21 47.7		4 49.5	+10 30.7	+1.1108	0.5693	0.1146	+68 +30		
B. Sagittarii	6.4	1.99	2.8	19 23.3		8 46.5	- 9 40.9	-0.9198	0.5690	0.1229	-25 -90		
B. Sagittarii	6.1	+1.90	+3.3	-19 2.0		15 7.5	- 3 33.7	-0.4614	0.5684	+0.1359	+ 3 -69		
B. Sagittarii	5.8	1.88	3.1	18 24.8		15 24.0	- 3 17.8	-1.0649	0.5684	0.1365	-34 -90		
Sagittarii	5.1	1.85	4.1	19 57.5		19 22.8	+ 0 32.4	+1.0879	0.5680	0.1444	+70 +27		
Sagittarii	6.0	1.81	4.1	19 15.2		21 53.7	+ 2 57.8	+0.7297	0.5677	0.1493	+71 + 2		
B. Capricorni	6.4	1.57	4.4	16 0.7	5	13 42.4	- 5 47.5	-0.0001	0.5657	0.1779	+32 -39		
Capricorni	6.2	+1.55	+4.2	-15 19.8		14 44.0	- 4 48.3	-0.5112	0.5655	+0.1796	+ 5 -73		
Capricorni	5.2	1.51	4.5	15 14.5		18 17.5	- 1 22.3	+0.0491	0.5651	0.1855	+35 -36		
B. Capricorni	5.9	1.40	5.0	14 47.9	6	2 45.3	+ 6 47.5	+1.2226	0.5642	0.1984	+75 +38		
Aquarii	4.5	1.32	4.4	11 42.2		7 32.2	+11 24.1	-0.9391	0.5637	0.2052	-17 -90		
Aquarii	6.5	1.29	4.2	10 56.6		9 35.7	-10 36.7	-1.2778	0.5635	0.2079	-47 -89		
Aquarii	5.6	+1.23	+4.3	-10 5.8		14 23.3	- 5 59.2	-1.1149	0.5632	+0.2140	-29 -90		
B. Aquarii	6.5	1.23	4.9	11 55.4		15 41.5	- 4 43.8	+0.9981	0.5630	0.2156	+78 +18		
B. Capricorni	6.2	1.17	4.9	10 56.7		20 37.6	+ 0 1.8	+1.0933	0.5628	0.2212	+79 +24		
Capricorni	5.3	1.13	4.6	9 27.5		23 4.1	+ 2 23.1	+0.1482	0.5627	0.2238	+45 -31		
Capricorni	6.3	1.13	4.7	9 39.2		23 37.4	+ 2 55.3	+0.4676	0.5627	0.2243	+65 -14		
Aquarii	5.6	+1.04	+4.3	-6 55.1	7	7 6.4	+10 8.4	-0.5559	0.5626	+0.2313	+ 8 -75		
B. Aquarii	6.4	0.99	4.1	5 7.5		11 16.5	- 9 50.3	-1.3671	0.5628	0.2347	-59 -75		
Aquarii	5.7	0.98	4.3	5 47.8		13 11.4	- 7 59.4	-0.2482	0.5628	0.2361	+25 -54		
Aquarii	5.8	0.95	4.3	5 15.1		16 16.0	- 5 1.4	-0.0590	0.5630	0.2381	+35 -42		
Aquarii	6.3	0.91	4.0	3 19.8		19 26.0	- 1 58.1	-1.2049	0.5632	0.2400	+33 -90		
Aquarii	5.2	+0.90	+4.4	-4 39.0		22 15.4	+ 0 45.4	+0.7816	0.5635	+0.2415	+85 + 3		
Aquarii	6.3	0.88	4.3	3 58.8		23 35.4	+ 2 2.5	+0.4408	0.5636	0.2421	+66 -16		
Piscium	6.2	0.83	4.3	2 50.0	8	7 13.9	+ 9 24.7	+1.1682	0.5646	0.2448	+87 +29		
Piscium	6.3	0.81	3.9	0 15.2		8 16.5	+10 25.2	-1.1203	0.5648	0.2450	-25 -90		
NEW MOON.													
Arietis	5.0	+0.84	+3.6	+20 44.5	12	17 16.8	- 8 31.1	-0.0995	0.5957	+0.1197	+34 -31		
Arietis	5.2	0.87	3.6	20 51.2		19 45.2	- 6 8.6	+0.0783	0.5959	0.1137	+44 -21		
Arietis	5.2	0.87	3.5	20 27.0		20 21.4	- 5 33.8	+0.5496	0.5960	0.1122	+77 + 5		
Arietis	6.0	0.88	3.5	20 30.9		21 0.8	- 4 55.9	+0.5591	0.5960	0.1106	+78 + 5		
Arietis	6.1	+0.90	+3.8	+22 31.4		22 33.5	- 3 27.0	-1.2859	0.5962	+0.1068	-59 -67		
Tauri	6.5	0.93	3.3	20 39.0	13	2 42.4	+ 0 31.9	+1.0149	0.5962	0.0964	+90 +35		
Tauri	6.1	0.95	3.2	20 40.3		4 50.6	+ 2 35.1	+1.1951	0.5962	0.0910	+90 +51		
Tauri	5.5	0.97	3.6	23 10.3		6 19.7	+ 4 0.6	-1.1883	0.5962	0.0872	-40 -67		
Tauri	5.9	0.98	3.3	21 59.8		6 57.5	+ 4 36.9	+0.0489	0.5961	0.0856	+42 -19		
Tauri	5.8	+1.00	+3.2	+22 14.6		9 40.2	+ 7 13.2	+0.0226	0.5959	+0.0787	+40 -19		
Tauri	6.0	1.01	3.4	22 56.4		9 44.4	+ 7 17.2	-0.6739	0.5959	0.0785	+ 1 -64		
Tauri	6.5	1.02	3.3	22 58.3		11 15.6	+ 8 44.7	-0.5907	0.5958	0.0746	+ 6 -57		
Tauri	4.5	1.03	3.0	21 51.6		12 44.2	+10 9.7	+0.6401	0.5957	0.0707	+88 +13		
Tauri	6.1	1.04	2.9	21 47.4		12 59.1	+10 24.1	+0.7288	0.5956	0.0701	+90 +19		
Tauri	6.1	+1.06	+2.9	+22 12.3		15 55.8	-10 46.2	+0.5052	0.5952	+0.0624	+74 + 7		
Tauri	6.1	1.12	3.1	24 6.7		20 16.6	- 6 35.8	-1.1839	0.5944	0.0511	-41 -66		
Tauri	4.1	1.12	2.6	22 6.5		20 50.4	- 6 3.3	+0.8802	0.5943	0.0496	+90 +30		
Tauri	5.4	1.12	2.5	22 0.9		20 51.6	- 6 2.1	+0.9766	0.5943	0.0496	+90 +36		
Tauri	4.2	1.13	2.7	22 37.8		21 12.1	- 5 42.4	+0.3683	0.5942	0.0487	+83 + 1		
Tauri	5.4	+1.13	+2.7	+22 48.8		21 35.4	- 5 20.1	+0.2000	0.5941	+0.0477	+82 + 2		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Position		
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N. S.			
		$\Delta\alpha$	$\Delta\delta$										
		<i>s</i>	<i>"</i>	<i>s</i>	<i>d</i>	<i>h</i>	<i>m</i>	<i>h</i>	<i>m</i>	<i>s</i>	<i>"</i>		
284 B. Tauri	6.0	+1.18	+2.5	+23 10.5	14	1	12.2	-1	51.8	-0.0125	0.5932	+0.0382	+39-19
τ Tauri	4.3	1.20	2.3	22 48.1		3	29.2	+0	19.9	+0.4492	0.5925	0.0323	+69-7
95 Tauri	6.2	1.21	2.6	23 56.1		3	51.5	+0	41.2	-0.6965	0.5924	0.0313	-1-43
300 B. Tauri	6.2	1.22	2.4	23 28.8		4	50.7	+1	38.1	-0.2016	0.5921	0.0287	+28-27
315 B. Tauri	6.3	1.28	2.4	24 27.8		9	1.2	+5	38.8	-1.1125	0.5907	0.0179	-32-46
99 Tauri	6.0	+1.28	+2.1	+23 49.3		9	38.7	+6	14.8	-0.4454	0.5905	+0.0163	+14-47
103 Tauri	5.5	1.33	1.9	24 9.5		13	45.0	+10	11.6	-0.7471	0.5888	+0.0057	-4-66
121 Tauri	5.1	1.46	1.0	23 59.2	15	0	47.2	-3	11.9	-0.6661	0.5835	-0.0220	+1-60
175 H. Tauri	6.5	1.48	0.3	22 37.2		3	30.5	+0	34.7	+0.6806	0.5820	0.0287	+90-30
394 B. Tauri	6.0	1.49	0.4	23 10.0		4	1.0	-0	5.4	+0.0995	0.5817	0.0299	+45-12
412 B. Tauri	5.8	+1.57	+0.3	+24 14.3		9	36.5	+5	17.5	-1.2230	0.5784	-0.0433	-47-66
141 Tauri	6.3	1.57	-0.5	22 24.0		11	36.8	+7	13.2	+0.6027	0.5772	0.0480	+84-13
1 Geminorum	4.3	1.60	0.3	23 16.1		12	36.6	+8	10.8	-0.3533	0.5765	0.0503	+19-39
14 B. Geminorum	6.0	1.61	0.9	22 12.2		14	53.7	+10	22.8	+0.6389	0.5751	0.0556	+88-15
3 Geminorum	5.6	1.62	0.6	23 7.7		14	57.6	+10	26.6	-0.3312	0.5751	0.0557	-20-38
6 Geminorum	6.3	+1.63	-0.8	+22 55.7		16	2.9	+11	29.4	-0.1841	0.5743	-0.0582	+29-30
η Gemin. (var.)	3.2	1.64	1.0	22 31.9		17	8.0	-11	27.8	+0.1665	0.5736	0.0606	+49-11
9 Geminorum	6.2	1.67	0.6	23 46.2		17	59.9	-10	37.8	-1.1844	0.5730	0.0626	-41-66
μ Geminorum	3.2	1.69	1.3	22 33.4		20	32.8	-8	10.4	-0.0798	0.5713	0.0683	+35-25
36 B. Geminorum	6.0	1.71	1.1	23 22.4		21	38.3	-7	7.4	-1.0140	0.5705	0.0706	-23-67
d Geminorum	5.2	+1.82	-2.8	+21 51.5	16	8	53.3	+3	43.4	-0.3498	0.5626	-0.0941	+20-43
ζ Gemin. (var.)	3.7	1.87	3.7	20 41.4		14	26.7	+9	5.1	+0.3346	0.5585	0.1050	+60-7
120 B. Geminorum	6.5	1.91	3.8	21 23.4		17	7.2	+11	39.9	-0.6966	0.5565	0.1100	0-68
56 Geminorum	5.2	1.96	4.6	20 35.9		22	27.5	-7	10.6	-0.4681	0.5525	0.1196	+13-53
61 Geminorum	5.8	1.98	4.8	20 25.3	17	0	43.9	-4	58.9	-0.5559	0.5509	0.1236	+8-60
g Geminorum	5.0	+2.05	-6.3	+18 42.6		9	37.6	+3	37.0	+0.1119	0.5443	-0.1382	+46-22
209 B. Geminorum	6.2	2.10	6.3	19 32.1		12	20.8	+6	14.8	-1.1574	0.5424	0.1424	-34-70
3 Cancr	5.7	2.11	7.4	17 31.9		16	33.8	+10	19.6	+0.3849	0.5394	0.1486	+63-9
5 Cancr	5.9	2.10	7.8	16 40.8		16	54.9	+10	40.0	+1.2514	0.5391	0.1491	+88-50
ζ Cancr (mean)	4.7	2.18	7.9	17 53.6		22	2.0	-8	22.7	-0.8405	0.5356	0.1562	-8-72
d^2 Cancr	6.2	+2.23	-8.7	+17 18.9	18	4	41.4	-1	55.8	-1.2858	0.5311	-0.1648	+49-73
90 B. Cancr	6.3	2.26	9.7	15 35.7		9	47.7	+3	0.9	-0.2767	0.5279	0.1709	+24-48
209 B. Cancr	6.5	2.37	12.4	11 53.7	19	2	54.4	+4	23.4	+0.6826	0.5182	0.1884	+89-2
222 B. Cancr	6.3	2.41	12.8	11 50.5		7	6.0	-0	19.2	-0.0553	0.5161	0.1920	+36-38
ξ Leonis	5.1	2.47	13.4	11 39.6		14	29.5	+6	51.4	-1.2976	0.5127	0.1976	-46-78
h Leonis	5.2	+2.45	-13.9	+10 4.5		14	30.7	+6	52.6	+0.4420	0.5127	-0.1977	+67-13
o Leonis	3.8	2.49	14.2	10 15.7		19	23.3	+11	36.8	-0.7372	0.5107	0.2010	-1-80
83 B. Leonis	5.9	2.55	15.0	9 19.1	20	3	34.6	-4	25.9	-1.3653	0.5078	0.2059	-59-72
89 B. Leonis	6.2	2.55	15.3	8 42.1		4	29.4	-3	32.7	-0.8735	0.5075	0.2064	-9-81
π Leonis	4.9	2.56	15.4	8 26.0		5	37.2	-2	26.8	-0.8116	0.5072	0.2070	-5-82
14 Sextantis	6.3	+2.57	-16.3	+6 0.5		9	12.0	+1	2.0	+1.1247	0.5061	-0.2087	+90-28
155 B. Leonis	6.5	2.64	16.8	6 6.4		18	10.4	+9	45.4	-0.8738	0.5040	0.2124	-9-84
237 B. Leonis	6.3	2.73	18.7	1 27.3	21	10	8.4	+1	17.0	+0.8548	0.5018	0.2163	+90-8
55 Leonis	6.1	2.75	18.8	1 10.1		12	3.5	+3	9.0	+0.7566	0.5017	0.2165	+90-2
p^3 Leonis	6.1	2.77	19.1	0 26.1		16	26.5	+7	24.7	+0.6207	0.5015	0.2170	+81-6
p^5 Leonis	5.3	+2.81	-19.2	+0 22.3	22	2	3.6	-11	7.4	-0.5278	0.5015	-0.2172	+11-73
388 B. Leonis	6.3	2.86	19.7	-1 15.2	22	5	53.3	-3	30.6	-0.4214	0.5019	0.2167	+17-65
e Leonis	5.1	2.87	20.0	2 33.4		7	13.6	-2	12.5	+0.7356	0.5020	0.2166	+87-0
431 B. Leonis	6.2	2.90	19.9	1 59.3		11	41.7	+2	8.2	-0.8620	0.5025	0.2159	-8-90
13 B. Virginis	5.9	2.95	20.5	4 53.0		18	39.5	+8	54.6	+0.8553	0.5036	0.2144	+85-7
64 B. Virginis	6.5	+3.02	-20.6	-7 19.4	23	5	17.4	-4	45.1	+1.3046	0.5059	-0.2108	+83-45

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	"	d h m	h m				"	"
B. Virginis	5.3	+3.11	-20.6	-9 0.3	23 17 55.1	+7 31.3	+0.5451	0.5096	-0.2045	+71	-10
B. Virginis	6.0	3.19	20.4	11 12.6	24 4 52.1	-5 50.4	+0.7861	0.5136	0.1973	+79	+5
B. Virginis	5.7	3.28	19.4	12 17.2	21 46.8	+10 34.8	-1.2415	0.5210	0.1827	-43	-90
B. Virginis	5.6	3.33	19.3	14 56.8	25 0 54.8	-10 22.8	+1.1283	0.5225	0.1795	+75	+29
B. Virginis	5.6	3.37	18.8	15 46.3	6 49.4	-4 38.9	+0.9953	0.5254	0.1732	+74	+18
B. Virginis	6.1	+3.36	-18.8	-15 21.7	7 22.7	-4 6.5	+0.4458	0.5257	-0.1725	+59	-15
B. Virginis	6.5	3.41	17.8	15 56.9	17 12.4	+5 25.2	-0.5452	0.5308	0.1606	+2	-76
B. Virginis	5.1	3.42	17.5	15 55.2	19 58.9	+8 6.6	-1.0169	0.5323	0.1570	-27	-90
B. Virginis	5.5	3.46	17.3	17 49.4	22 12.6	+10 16.1	+0.7283	0.5334	0.1539	+72	+2
B. Virginis	6.4	3.47	17.1	18 12.6	23 1.2	+11 3.2	+1.0280	0.5339	0.1528	+72	+22
B. Virginis	5.7	+3.48	-17.1	-18 20.5	23 47.6	+11 48.1	+1.0548	0.5344	-0.1518	+72	+24
Librae	4.7	3.55	13.6	19 29.2	27 1 20.4	-11 28.4	-1.0730	0.5478	0.1114	-37	-90
Librae	6.0	3.54	13.5	19 20.6	1 51.2	-10 58.6	-1.2857	0.5481	0.1104	-62	-76
B. Librae	6.2	3.57	12.2	20 27.0	9 48.9	+3 16.8	-0.8988	0.5520	0.0958	-26	-90
B. Librae	5.9	3.58	11.6	20 44.9	13 18.6	+0 5.8	-0.8970	0.5537	0.0892	-27	-90
Scorpii	2.5	+3.60	-9.7	-22 23.5	23 15.6	+9 42.5	+0.0971	0.5580	-0.0694	+26	-34
B. Scorpii	5.7	3.62	9.1	23 23.2	28 1 49.7	-11 48.7	+1.0011	0.5590	0.0641	+67	+22
B. Scorpii	5.8	3.62	8.9	23 28.2	2 59.9	-10 40.9	+1.0178	0.5594	0.0617	+67	+24
B. Scorpii	4.9	3.62	7.8	23 58.5	8 16.7	+5 35.1	+1.2650	0.5613	0.0506	+66	+56
Ophiuchi	4.7	3.59	7.5	23 15.6	10 28.6	+3 27.8	+0.3878	0.5621	0.0459	+41	-17
B. Scorpii	6.1	+3.59	-6.0	-24 18.7	17 30.3	+3 19.1	+1.2493	0.5643	-0.0306	+66	+53
Ophiuchi	5.5	3.52	5.0	23 1.4	29 0 9.4	+9 44.0	-0.2914	0.5660	-0.0158	0	-57
Ophiuchi	5.1	3.50	3.0	24 12.0	9 20.3	+5 24.8	+0.9192	0.5677	+0.0050	+66	+16
B. Ophiuchi	6.3	3.47	2.4	24 10.2	12 23.9	-2 27.7	+0.9128	0.5681	0.0120	+66	+16
Ophiuchi	4.3	3.47	2.4	24 6.1	12 56.8	-1 56.0	+0.8463	0.5682	0.0132	+66	+11
Ophiuchi	4.8	+3.44	-2.0	-23 54.0	15 7.6	+0 10.1	+0.6652	0.5685	+0.0182	+60	-1
Sagittarii	4.8	3.34	+0.3	23 48.6	30 3 20.3	+11 56.5	+0.9565	0.5691	0.0460	+66	+19
B. Sagittarii	5.7	3.30	0.2	22 46.8	4 15.8	-11 10.0	-0.0945	0.5692	0.0481	+14	-45
B. Sagittarii	5.2	3.29	1.2	23 43.1	8 28.0	-7 6.9	+1.1235	0.5691	0.0576	+66	+33
B. Sagittarii	5.6	3.23	0.9	21 44.1	9 35.5	-6 1.8	-0.9118	0.5690	0.0601	-31	-90
B. Sagittarii	5.7	+3.11	+2.6	-21 28.0	19 46.0	+3 46.7	-0.4669	0.5683	+0.0827	-2	-70
B. Sagittarii	5.9	3.10	2.6	21 7.2	20 11.9	+4 11.6	-0.7961	0.5682	0.0836	-21	-90
B. Sagittarii	6.3	3.07	3.0	21 5.1	22 57.8	+6 51.6	-0.5926	0.5679	0.0896	-9	-82
B. Sagittarii	5.6	+3.10	+3.6	-22 28.7	23 23.2	+7 16.0	+0.9128	0.5678	+0.0905	+68	+15

MAY.

Sagittarii	5.3	+3.03	+3.2	-20 25.1	1 0 51.3	+8 40.9	-1.1209	0.5676	+0.0937	-43	-90
Sagittarii	6.2	3.07	3.8	22 15.4	1 20.0	+9 8.6	+0.8585	0.5676	0.0947	+68	+11
Sagittarii	5.8	3.03	3.8	21 27.6	2 42.5	+10 28.1	+0.1532	0.5674	0.0976	+32	-30
Sagittarii	5.1	+3.00	+3.8	-20 45.8	4 9.8	+11 52.4	-0.4349	0.5671	+0.1007	+1	-68
Sagittarii	3.7	3.01	4.0	21 12.9	4 19.4	-11 58.4	+0.0552	0.5672	0.1010	+27	-36
Sagittarii	3.9	2.99	4.7	21 51.7	7 19.2	-9 5.0	+1.0461	0.5667	0.1073	+68	+25
Sagittarii	3.0	2.95	4.8	21 9.2	9 32.1	-6 56.8	+0.5457	0.5663	0.1119	+58	-9
B. Sagittarii	6.3	2.92	4.4	19 55.9	9 34.2	-6 54.8	-0.7310	0.5663	0.1120	-14	-90
Sagittarii	5.0	+2.86	+4.7	-19 5.9	12 58.9	+3 37.5	-1.2092	0.5656	+0.1189	-50	-90
B. Sagittarii	6.4	2.84	5.0	19 23.2	14 42.6	-1 57.5	-0.6980	0.5653	0.1224	-11	-90
B. Sagittarii	6.1	2.76	5.9	19 2.0	21 10.3	+4 16.5	-0.2344	0.5640	0.1350	+15	-53
B. Sagittarii	5.8	2.74	5.7	18 24.8	21 27.2	+4 32.8	-0.8437	0.5640	0.1356	-19	-90
B. Sagittarii	6.0	2.67	6.9	19 15.1	2 4 4.6	+10 56.2	+0.9698	0.5625	0.1479	+71	+18
B. Capricorni	6.4	+2.40	+7.8	-16 0.7	20 15.8	+2 33.4	+0.2315	0.5589	+0.1755	+45	-28

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y'</i>	<i>x'</i>	<i>y'</i>	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
27 G. Capricorni	6.2	+2.38	+7.6	-15 19.8	d 21 18.9	+ 3 34.3	-0.2863	0.5586	+0.1771	+17	-56		
r Capricorni	5.2	2.33	8.0	15 14.5	3 0 58.2	+ 7 6.1	+0.2802	0.5578	0.1827	+48	-24		
84 B. Capricorni	6.0	2.24	7.7	12 50.8	6 6.1	-11 56.8	-1.2240	0.5568	0.1901	-42	-90		
v Aquarii	4.5	2.11	8.1	11 42.1	14 36.0	- 3 44.5	-0.7284	0.5553	0.2014	- 4	-90		
51 G. Aquarii	6.5	2.07	8.0	10 56.6	16 43.3	- 1 41.6	-1.0738	0.5550	0.2040	-27	-90		
19 Aquarii	5.6	+2.00	+8.1	-10 5.8	21 40.0	+ 3 5.1	-0.9123	0.5543	+0.2098	-15	-90		
72 B. Aquarii	6.5	2.00	8.9	11 55.3	23 0.7	+ 4 23.0	+1.2315	0.5542	0.2113	+78	+38		
137 B. Capricorni	6.2	1.93	8.9	10 56.6	4 4 6.5	+ 9 18.3	+1.3241	0.5537	0.2166	+79	+50		
c ¹ Capricorni	5.3	1.88	8.6	9 27.4	6 37.8	+11 44.4	+0.3620	0.5534	0.2191	+58	-20		
c ² Capricorni	6.3	1.88	8.7	9 39.2	7 12.2	-11 42.3	+0.6860	0.5534	0.2196	+80	-2		
30 Aquarii	5.6	+1.76	+8.2	- 6 55.0	14 56.3	- 4 14.0	-0.3620	0.5531	+0.2263	+18	-61		
138 B. Aquarii	6.4	1.70	7.9	5 7.4	19 14.9	- 0 4.2	-1.1913	0.5531	0.2294	-33	-90		
44 Aquarii	5.7	1.68	8.2	5 47.7	21 13.8	+ 5 6.0	-0.0570	0.5531	0.2307	+35	-42		
51 Aquarii	5.8	1.64	8.2	5 15.0	5 0 24.8	+ 4 55.2	+0.1311	0.5533	0.2327	+46	-32		
187 B. Aquarii	6.3	1.59	7.7	3 19.8	3 41.3	+ 8 5.0	-1.0378	0.5535	0.2345	-20	-90		
κ Aquarii	5.2	+1.57	+8.2	- 4 38.9	6 36.4	+10 54.3	+0.9766	0.5537	+0.2359	+85	+15		
207 B. Aquarii	6.3	1.55	8.1	3 58.7	7 59.2	-11 45.9	+0.6282	0.5539	0.2365	-80	- 6		
6 G. Piscium	6.2	1.46	8.0	2 50.0	15 53.3	- 4 8.0	+1.3548	0.5550	0.2390	+80	+53		
3 Piscium	6.3	1.44	7.3	0 15.2	16 58.0	- 3 5.5	-0.9719	0.5552	0.2392	-15	-90		
κ Piscium	4.9	1.32	7.2	+ 0 48.5	6 4 46.6	+ 8 18.7	+0.8020	0.5578	0.2401	+90	+ 4		
9 Piscium	6.4	+1.32	+7.3	+ 0 40.4	4 55.1	+ 8 26.9	+0.9702	0.5578	+0.2401	+90	+15		
16 Piscium	5.7	1.28	7.1	1 38.9	9 0.2	-11 36.4	+0.9768	0.5590	0.2396	+90	+16		
19 Piscium	5.4	1.24	6.8	3 2.0	13 26.6	+ 7 19.4	+0.6586	0.5604	0.2386	+85	- 4		
ω Piscium	4.0	1.19	6.0	6 24.7	19 8.3	- 1 49.6	-1.3464	0.5625	0.2366	-52	-79		
36 Piscium	6.2	1.13	5.8	7 47.2	7 2 41.6	+ 5 27.8	-0.9374	0.5654	0.2326	-13	-82		
d Piscium	5.4	+1.12	+5.8	+ 7 44.2	4 26.7	+ 7 9.1	-0.4810	0.5662	+0.2315	+14	-67		
136 B. Piscium	6.5	1.06	5.5	8 54.6	13 20.0	- 8 16.8	+0.3842	0.5701	0.2246	+62	-16		
75 Piscium	6.3	1.00	4.9	12 31.1	8 0 5.0	+ 2 4.7	-0.8348	0.5753	+0.2133	- 7	-77		
NEW MOON.													
108 Tauri	6.2	+1.15	+0.3	+22 11.5	12 2 42.3	+ 0 49.9	+1.1425	0.5946	-0.0032	+90	+54		
121 Tauri	5.1	1.23	0.0	23 59.2	10 36.2	+ 8 25.3	-0.8002	0.5911	0.0235	- 8	-66		
175 H ¹ . Tauri	6.5	1.23	-0.4	22 37.2	13 16.2	+10 59.1	+0.5311	0.5897	0.0302	+76	+11		
394 B. Tauri	6.0	1.24	0.4	23 10.0	13 46.0	+11 27.7	-0.0454	0.5895	0.0315	+36	-20		
141 Tauri	6.3	1.30	1.1	22 24.0	21 11.9	- 5 23.6	+0.4437	0.5852	0.0497	+69	+ 5		
1 Geminorum	4.3	+1.31	-1.0	+23 16.1	22 10.5	- 4 27.3	-0.5041	0.5846	-0.0520	+10	-49		
14 B. Geminorum	6.0	1.32	1.4	22 12.2	13 0 24.3	+ 2 18.4	+0.4757	0.5831	0.0574	+71	+ 6		
3 Geminorum	5.6	1.33	1.2	23 7.7	0 28.3	-21 4.7	-0.4849	0.5831	0.0575	-12	-49		
6 Geminorum	6.3	1.34	1.4	22 55.7	1 32.1	- 1 13.3	-0.3405	0.5824	0.0600	+20	-40		
η Gemin. (var.)	3.2	1.34	1.5	22 31.9	2 35.8	- 0 12.1	+0.0054	0.5817	0.0625	+39	-20		
μ Geminorum	3.2	+1.38	-1.8	+22 33.4	5 55.9	+ 3 0.6	-0.2420	0.5794	-0.0701	+25	-34		
36 B. Geminorum	6.0	1.39	1.7	23 22.4	6 59.8	+ 4 2.0	-1.1678	0.5787	0.0725	-38	-67		
d Geminorum	5.2	1.48	3.0	21 51.5	17 59.1	- 9 22.9	-0.5213	0.5706	0.0962	+10	-55		
ζ Gemin. (var.)	3.7	1.51	3.7	20 41.4	23 24.7	- 4 9.1	+0.1509	0.5664	0.1071	+48	-17		
120 B. Geminorum	6.5	1.54	3.9	21 23.4	14 2 1.4	- 1 37.9	-0.8715	0.5643	0.1121	-12	-69		
56 Geminorum	5.2	+1.58	-4.4	+20 35.9	7 14.3	+ 3 24.1	-0.6496	0.5602	-0.1218	+ 3	-66		
61 Geminorum	5.8	1.60	4.7	20 25.3	9 27.5	+ 5 32.7	-0.7380	0.5584	0.1258	- 3	-70		
f Geminorum	5.3	1.63	5.9	17 51.6	15 8.1	+11 1.5	+1.2333	0.5539	0.1354	+90	+50		
g Geminorum	5.0	1.67	5.9	18 42.6	18 9.2	-10 3.5	-0.0832	0.5514	0.1403	+34	-33		
2 B. Cancrī	6.0	1.70	7.0	16 44.3	23 53.6	- 4 30.7	+1.1860	0.5469	0.1491	+90	+43		
3 Cancrī	5.7	+1.72	-6.8	+17 31.9	15 0 56.2	- 3 30.1	+0.1832	0.5461	-0.1507	+50	-20		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.			Hour Angle, <i>H</i>	<i>Y'</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$										
		<i>s</i>	<i>"</i>	<i>"</i>	<i>d</i>	<i>h</i>	<i>m</i>	<i>s</i>				<i>"</i>	<i>"</i>
Cancr	5.9	+1.71	-7.2	+16 40.8	15	1	16.9	-3 10.2	+1.0405	0.5458	-0.1512	+90	+30
Cancr (<i>mean</i>)	4.7	1.78	7.2	17 53.6		6	17.6	+1 40.7	-1.0323	0.5420	0.1582	-22	-72
3. Cancr	6.3	1.86	8.8	15 35.7		17	49.3	-11 9.8	-0.4782	0.5335	0.1727	+13	-60
Cancr	4.3	1.93	10.8	12 10.4	16	4	55.8	-0 23.8	+1.2362	0.5259	0.1844	+90	+43
3. Cancr	6.5	1.98	11.3	11 53.8		10	38.4	+5 8.3	+0.4708	0.5224	0.1896	+69	-10
3. Cancr	6.3	+2.02	-11.6	+11 50.5		14	46.2	+9 8.8	-0.2609	0.5200	-0.1931	+25	-50
Leonis	5.5	2.05	12.8	9 24.7		20	15.7	-9 31.5	+1.3169	0.5170	0.1972	+84	+52
Leonis	5.2	2.08	12.6	10 4.5		22	4.8	-7 45.6	+0.2337	0.5160	0.1985	+52	-24
Leonis	3.8	2.12	12.9	10 15.8	17	2	53.7	-3 5.1	-0.9358	0.5136	0.2017	-13	-80
3. Leonis	6.2	2.20	13.9	8 42.1		11	53.8	+5 39.5	-1.0688	0.5098	0.2067	-22	-81
Leonis	4.9	+2.20	-14.1	+8 26.1		13	0.9	+6 44.6	-1.0069	0.5094	-0.2072	-18	-82
Sextantis	6.3	2.22	15.1	6 0.5		16	33.7	+10 11.4	+0.9195	0.5080	0.2089	+90	+13
Sextantis	5.9	2.25	15.6	5 1.0		19	48.5	-10 39.3	+1.3303	0.5069	0.2102	+84	+50
3. Leonis	6.5	2.30	15.4	6 6.4	18	1	27.6	-5 9.8	-1.0630	0.5053	0.2122	-22	-84
3. Leonis	6.3	2.44	17.6	1 27.3		17	20.0	+10 16.1	+0.6695	0.5021	0.2156	+86	-3
Leonis	6.1	+2.46	-17.7	+1 10.2		19	14.7	-11 52.2	+0.5734	0.5019	-0.2158	+76	-9
Leonis	6.1	2.49	18.0	0 26.2		23	36.6	-7 37.6	+0.4420	0.5015	0.2160	+66	-16
Leonis	5.3	2.55	18.1	0 22.3	19	5	12.7	-2 10.6	-0.6972	0.5013	0.2161	+2	-89
3. Leonis	6.3	2.62	18.8	-1 15.2		13	1.3	+5 25.1	-0.5833	0.5014	0.2154	+8	-77
Leonis	5.1	2.63	19.2	2 33.4		14	21.5	+6 43.1	+0.5719	0.5015	0.2153	+76	-9
3. Leonis	6.2	+2.68	-19.0	-1 59.3		18	49.2	+11 3.3	-1.0166	0.5018	-0.2145	-18	-90
3. Virginis	5.9	2.74	19.9	4 53.0	20	1	46.5	-6 10.8	+0.7047	0.5027	0.2128	+85	-1
3. Virginis	6.5	2.85	20.4	7 19.4		12	24.0	+4 9.0	+1.1666	0.5049	0.2092	+83	+30
3. Virginis	5.3	2.98	20.5	9 0.3	21	1	1.5	-7 34.6	+0.4254	0.5087	0.2029	+62	-16
3. Virginis	6.0	3.11	20.6	11 12.6		11	58.2	+3 3.4	+0.6810	0.5128	0.1957	+78	-2
Virginis	5.7	+3.28	-19.6	-12 17.2	22	4	51.8	-4 32.6	-1.3184	0.5207	-0.1812	-55	-81
Virginis	5.6	3.34	19.9	14 56.8		7	59.3	-1 30.7	+1.0508	0.5224	0.1781	+75	+22
Virginis	5.6	3.41	19.5	15 46.4		13	53.0	+4 12.4	+0.9265	0.5256	0.1718	+74	+14
Virginis	6.1	3.41	19.4	15 21.7		14	26.2	+4 44.6	+0.3792	0.5259	0.1712	+54	-18
3. Virginis	6.5	3.51	18.5	15 56.9	23	0	13.9	-9 45.7	-0.5952	0.5314	0.1594	-1	-80
3. Virginis	5.1	+3.53	-18.2	-15 55.2		2	59.7	-7 5.0	-1.0616	0.5330	-0.1558	-31	-90
3. Virginis	5.5	3.58	18.2	17 49.4		5	12.8	-4 56.0	+0.6818	0.5344	0.1529	+71	-1
3. Virginis	6.4	3.59	18.1	18 12.6		6	1.1	+4 9.3	+0.9817	0.5348	0.1517	+72	+18
3. Virginis	5.7	3.60	18.1	18 20.5		6	47.2	-3 24.7	+1.0096	0.5353	0.1507	+72	+20
Librae	4.7	3.82	14.5	19 29.2	24	8	9.6	-2 51.6	-1.0757	0.5503	0.1105	-37	-90
Librae	6.0	+3.82	-14.4	-19 20.6		8	40.2	-2 22.0	-1.2867	0.5505	-0.1096	-63	-76
3. Librae	6.2	3.90	13.1	20 27.0		16	33.5	+5 15.4	-0.8909	0.5549	0.0951	-26	-90
3. Librae	5.9	3.92	12.4	20 44.9		20	1.1	+8 35.9	-0.8845	0.5568	0.0884	-26	-90
Scorpii	2.5	4.01	10.6	22 23.5	25	5	51.6	-5 53.9	+0.1173	0.5617	0.0686	+27	-32
3. Scorpii	5.7	4.04	10.0	23 23.2		8	24.0	-3 26.9	+1.0200	0.5628	0.0634	+67	+24
3. Scorpii	5.8	+4.05	-9.8	-23 28.2		9	33.4	-2 19.9	+1.0379	0.5633	-0.0609	+67	+25
Ophiuchi	4.7	4.06	8.3	23 15.7		16	56.7	+4 47.8	+0.4197	0.5664	0.0450	+43	-15
Ophiuchi	5.5	4.07	5.3	23 1.4	26	6	27.0	-6 10.8	-0.2409	0.5707	-0.0148	+3	-54
Ophiuchi	5.1	4.10	3.2	24 12.0		15	30.6	+2 33.0	+0.9730	0.5726	+0.0061	+66	+20
3. Ophiuchi	6.3	4.09	2.4	24 10.2		18	31.8	+5 27.6	+0.9697	0.5730	0.0131	+66	+20
Ophiuchi	4.3	+4.09	-2.4	-24 6.1		19	4.3	+5 59.0	+0.9042	0.5732	+0.0144	+66	+15
Ophiuchi	4.8	4.08	1.9	23 54.0		21	13.3	-8 3.3	+0.7262	0.5734	0.0193	+66	+3
Ophiuchi	6.4	4.01	-1.7	21 59.4		22	54.5	+9 40.9	-1.2667	0.5736	0.0233	-66	-75
Sagittarii	4.8	4.03	+0.9	23 48.6	27	9	16.5	-4 20.0	+1.0277	0.5740	0.0473	+66	+25
3. Sagittarii	5.7	3.99	0.9	22 46.7		10	11.3	-3 27.1	-0.0176	0.5740	0.0494	+18	-45
Sagittarii	5.2	+4.00	-2.0	-23 43.1		14	20.4	+0 32.9	+1.1988	0.5739	+0.0590	+66	+43

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S						AT CONJUNCTION IN R. A.						Limiting Position	
	Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.	
			$\Delta\alpha$	$\Delta\delta$									
			s	"	"	d h m	h m						
14	Sagittarii	5.6	+3.93	+ 2.0	-21 44.1	27 15 27.1	+ 137.1	-0.8268	0.5738	+0.0615	-25	-90	
115 B.	Sagittarii	5.7	3.86	4.1	21 27.9	28 1 30.5	+11 18.5	-0.3757	0.5727	0.0841	+ 2	-63	
121 B.	Sagittarii	5.9	3.85	4.1	21 7.2	1 56.2	+11 43.3	-0.7033	0.5727	0.0850	-16	-90	
128 B.	Sagittarii	6.3	3.83	4.7	21 5.1	4 40.3	- 938.5	-0.4985	0.5722	0.0910	- 4	-73	
28	Sagittarii	5.6	3.86	5.1	22 28.6	5 5.5	- 914.3	+1.0020	0.5721	0.0919	+68	+22	
29	Sagittarii	5.3	+3.79	+ 5.0	-20 25.1	6 32.6	- 750.3	-1.0238	0.5718	+0.0951	-36	-90	
30	Sagittarii	6.2	3.84	5.4	22 15.3	7 1.0	- 722.8	+0.9494	0.5718	0.0961	+68	+17	
33	Sagittarii	5.8	3.80	5.6	21 27.6	8 22.8	- 6 4.1	+0.2476	0.5715	0.0990	+38	-25	
36	Sagittarii	5.1	3.78	5.7	20 45.8	9 49.2	- 440.8	-0.3377	0.5712	0.1021	+ 6	-60	
ξ	Sagittarii	3.7	3.79	5.8	21 12.8	9 58.7	- 431.7	+0.1510	0.5712	0.1024	+32	-31	
σ	Sagittarii	3.9	+3.78	+ 6.6	-21 51.7	12 56.9	+ 139.9	+1.1414	0.5705	+0.1087	+68	+34	
190 B.	Sagittarii	5.4	3.70	6.4	19 25.1	14 31.9	- 0 8.3	-1.2402	0.5701	0.1120	-55	-87	
π	Sagittarii	3.0	3.74	6.8	21 9.2	15 8.7	+ 027.1	+0.6440	0.5700	0.1133	+65	- 3	
195 B.	Sagittarii	6.3	3.71	6.6	19 55.9	15 10.7	+ 029.1	-0.6295	0.5700	0.1134	- 8	-86	
d	Sagittarii	5.0	3.65	7.1	19 5.9	18 33.8	+ 344.8	-1.1047	0.5691	0.1203	-39	-90	
226 B.	Sagittarii	6.4	+3.64	+ 7.5	-19 23.2	20 16.7	+ 524.0	-0.5936	0.5686	+0.1237	- 5	-81	
266 B.	Sagittarii	6.1	3.57	8.6	19 2.0	29 241.9	+11 35.4	-0.1271	0.5668	0.1363	+21	-46	
267 B.	Sagittarii	5.8	3.56	8.5	18 24.7	2 58.7	+11 51.6	-0.7355	0.5668	0.1368	-12	-90	
57	Sagittarii	6.0	3.50	9.9	19 15.1	9 34.2	- 546.9	+1.0802	0.5648	0.1490	+71	+26	
16 B.	Capricorni	6.2	3.28	10.7	15 2.5	22 12.6	+ 624.8	-1.2632	0.5607	0.1705	-50	-88	
β	Capricorni	3.2	+3.27	+10.8	-15 2.3	22 18.8	+ 630.8	-1.2485	0.5606	+0.1707	-48	-90	
31 B.	Capricorni	6.4	3.25	11.6	16 0.6	30 143.9	+ 948.8	+0.3499	0.5596	0.1760	+52	-20	
27 G.	Capricorni	6.2	3.22	11.4	15 19.7	2 47.1	+10 49.9	-0.1686	0.5592	0.1776	+23	-49	
45 B.	Capricorni	6.1	3.19	11.3	14 0.0	4 11.4	+11 48.8	-1.2885	0.5588	0.1797	-53	-85	
τ	Capricorni	5.2	3.18	12.0	15 14.4	6 26.8	- 937.9	+0.4003	0.5580	0.1830	+56	-17	
84 B.	Capricorni	6.0	+3.08	+11.9	-12 50.7	11 35.7	- 439.8	-1.1069	0.5564	+0.1902	-31	-90	
ν	Aquarii	4.5	2.96	12.5	11 42.0	20 8.6	+ 335.5	-0.6091	0.5540	0.2011	+ 2	-81	
51 G.	Aquarii	6.5	2.92	12.5	10 56.5	22 16.9	+ 539.5	-0.9559	0.5534	0.2035	-18	-90	
19	Aquarii	5.6	2.85	12.7	10 5.7	31 3 16.2	+10 28.5	-0.7939	0.5522	0.2090	- 7	-90	
c^1	Capricorni	5.3	2.73	13.4	9 27.3	12 20.2	- 445.8	+0.4881	0.5503	0.2177	+66	-13	
c^2	Capricorni	6.3	+2.73	+13.5	- 9 39.1	12 55.0	- 4 12.1	+0.8142	0.5502	+0.2183	+80	+ 6	
30	Aquarii	5.6	+2.60	+13.2	- 6 54.9	20 45.8	+ 322.9	-0.2422	0.5490	+0.2244	+25	-53	

JUNE.

138 B.	Aquarii	6.4	+2.53	+12.8	- 5 7.3	1 1 8.8	+ 737.1	-1.0798	0.5485	+0.2273	-24	-90
44	Aquarii	5.7	2.52	13.2	5 47.6	3 9.8	+ 934.0	+0.0640	0.5483	0.2285	+42	-36
51	Aquarii	5.8	2.47	13.2	5 14.9	6 24.2	+11 18.0	+0.2530	0.5481	0.2303	+53	-26
187 B.	Aquarii	6.3	2.42	12.7	3 19.7	9 44.6	- 8 4.3	-0.9284	0.5480	0.2318	-13	-10
κ	Aquarii	5.2	2.39	13.2	4 38.9	12 43.4	- 5 11.5	+1.1053	0.5480	0.2330	+85	-25
207 B.	Aquarii	6.3	+2.37	+13.2	- 3 58.6	14 7.9	- 349.8	+0.7529	0.5480	+0.2336	+86	+ 1
3	Piscium	6.3	2.25	12.2	- 0 15.1	23 18.9	+ 5 2.8	-0.8688	0.5484	0.2359	- 8	-90
κ	Piscium	4.9	2.11	12.1	+ 0 48.6	2 1 25.6	+ 7 14.7	+0.9198	0.5501	0.2362	+90	+12
9	Piscium	6.4	2.11	12.2	0 40.5	11 34.3	- 7 6.3	+1.0901	0.5502	0.2362	+90	+24
16	Piscium	5.7	2.05	11.9	1 39.0	15 46.0	- 3 3.0	+1.0945	0.5511	0.2356	+90	+24
19	Piscium	5.4	+2.00	+11.4	+ 3 2.1	20 19.9	+ 121.6	+0.7693	0.5522	+0.2344	+90	+ 3
ω	Piscium	4.0	1.95	10.3	6 24.7	3 2 11.5	+ 7 1.3	-1.2671	0.5539	0.2323	-40	-84
36	Piscium	6.2	1.87	9.9	7 47.3	9 58.3	- 928.0	-0.8590	0.5566	0.2282	- 8	-82
d	Piscium	5.4	1.85	9.9	7 44.3	11 46.5	- 743.5	-0.3976	0.5573	0.2271	+18	-61
136 B.	Piscium	6.5	1.76	9.3	8 54.6	20 55.9	+ 1 6.8	+0.4720	0.5610	0.2201	+69	-11
75	Piscium	6.3	+1.68	+ 8.1	+12 31.2	4 8 0.5	+11 48.0	-0.7741	0.5602	+0.2090	- 3	-77

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H .	Y .	x' .	y' .	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	"	d h m	h m				"	"
Piscium	3.7	+1.60	+ 7.1	+14 55.5	4 18 41.8	- 1 53.7	-1.0256	0.5717	+0.1955	-20	-75
Piscium	6.2	1.58	7.2	14 14.7	20 31.4	- 0 8.1	+0.0129	0.5727	0.1929	+40	-33
B. Arietis	5.8	1.55	6.4	16 33.0	5 1 44.6	+ 4 53.4	-1.3145	0.5754	0.1851	-54	-73
H. Arietis	6.5	1.50	5.8	17 38.5	9 54.3	-11 15.0	-0.9543	0.5797	0.1716	-16	-72
H. Arietis	6.4	1.50	5.8	16 50.5	10 34.5	-10 36.3	-0.0369	0.5801	0.1704	+37	-33
Arietis	6.2	+1.46	+ 4.9	+19 29.6	19 16.9	- 2 13.6	-1.2879	0.5844	+0.1542	-52	-71
Arietis	6.4	1.44	5.3	17 20.6	19 24.7	- 2 6.1	+0.8940	0.5845	0.1540	+90	+21
Arietis	5.7	1.43	4.6	19 39.8	6 0 2.7	+ 2 21.2	-0.7484	0.5867	0.1446	- 3	-70
Arietis	5.8	1.41	4.2	20 20.5	6 21.7	+ 8 25.6	-0.5594	0.5894	0.1312	+ 8	-60
Arietis (mean)	4.6	1.40	+ 4.0	21 0 9	6 48.9	+ 8 51.8	-1.1773	0.5896	+0.1302	-37	-69
NEW MOON.											
B. Geminorum	6.5	+1.43	- 4.2	+21 23.4	10 11 30.2	+ 9 38.9	-0.9170	0.5689	-0.1135	-15	-69
Geminorum	5.2	1.45	4.6	20 35.9	16 39.3	- 9 23.0	-0.6983	0.5651	0.1233	0	-69
Geminorum	5.8	1.47	4.8	20 25.3	18 50.7	- 7 16.2	-0.7873	0.5634	0.1273	- 6	-70
Geminorum	5.3	+1.47	- 5.7	+17 51.6	11 0 26.6	+ 1 52.0	+1.1717	0.5591	-0.1371	+90	+43
Geminorum	5.0	1.50	5.8	18 42.6	3 25.2	+ 1 0.4	-0.1394	0.5567	0.1420	+31	-36
B. Cancr	6.0	1.51	6.6	16 44.3	9 4 5	+ 6 28.2	+1.1203	0.5524	0.1510	+90	+37
Cancr	5.7	1.53	6.5	17 31.9	10 6.2	+ 7 27.9	+0.1228	0.5515	0.1525	+46	-23
Cancr	5.9	1.52	6.7	16 40.8	10 26.5	+ 7 47.4	+0.9752	0.5513	0.1530	+90	+25
Cancr (mean)	4.7	+1.57	- 6.9	+17 53.7	15 22.5	-11 26.4	-1.0874	0.5475	-0.1601	-26	-72
Cancr	5.9	1.59	8.2	14 28.8	23 8.9	- 3 55.3	+1.2682	0.5416	0.1703	+88	+50
B. Cancr	6.3	1.62	8.2	15 35.7	12 2 43.2	- 0 28.0	-0.5400	0.5389	0.1747	-10	-65
Cancr	4.3	1.68	9.8	12 10.4	13 39.0	+10 7.2	+1.1609	0.5312	0.1864	+90	+35
B. Cancr	6.5	1.72	10.3	11 53.8	19 16.1	- 8 26.0	+0.3995	0.5275	0.1916	+64	-14
B. Cancr	6.3	+1.75	-10.5	+11 50.5	23 20.1	- 4 29.5	-0.3283	0.5249	-0.1950	+21	-54
Leonis	5.5	1.78	11.5	9 24.7	13 4 44.6	+ 0 45.2	+1.2391	0.5217	0.1991	+90	+41
Leonis	5.2	1.80	11.4	10 4.5	6 32.0	+ 2 29.4	+0.1625	0.5207	0.2004	+48	-27
Leonis	3.8	1.83	11.6	10 15.8	11 16.6	+ 7 5.6	-1.0004	0.5181	0.2034	-18	-80
B. Leonis	6.2	1.90	12.5	8 42.1	20 9.3	- 8 17.3	-1.1331	0.5137	0.2082	-27	-81
Leonis	4.9	+1.91	-12.6	+ 8 26.1	21 15.6	- 7 12.9	-1.0716	0.5132	-0.2088	-22	-82
Sextantis	6.3	1.93	13.6	6 0 5	14 0 45.6	- 3 48.9	+0.8442	0.5117	0.2103	+90	+ 8
Sextantis	5.9	1.95	14.0	5 1 0	3 58.1	- 0 42.0	+1.2531	0.5104	0.2115	+90	+40
B. Leonis	6.5	2.00	13.9	6 6.4	9 33.3	+ 4 43.8	-1.1274	0.5083	0.2134	-26	-84
B. Leonis	6.3	2.14	16.0	1 27.3	15 1 16.6	- 3 59.4	+0.5991	0.5042	0.2162	+78	- 7
Leonis	6.1	+2.16	-16.1	+ 1 10.2	3 10.3	- 2 8.9	+0.5038	0.5038	-0.2163	+71	-12
Leonis	6.1	2.20	16.4	0 26.2	7 30.4	+ 2 4.0	+0.3740	0.5031	0.2165	+61	-19
Leonis	5.3	2.26	16.5	+ 0 22.3	13 4.3	+ 7 28.6	-0.7601	0.5025	0.2164	- 2	-90
B. Leonis	6.3	2.33	17.2	- 1 15.2	20 50.5	- 8 58.0	-0.6448	0.5021	0.2155	+ 5	-83
Leonis	5.1	2.35	17.6	2 33.3	22 10.4	- 7 40.4	+0.5075	0.5021	0.2153	+71	-12
B. Leonis	6.2	+2.40	-17.4	- 1 59.2	16 2 37.0	- 3 21.1	-1.0756	0.5022	-0.2144	-23	-90
B. Virginis	5.9	2.47	18.4	4 52.9	9 33.4	+ 3 23.9	+0.6438	0.5027	0.2125	+81	- 5
B. Virginis	6.5	2.60	19.1	7 19.4	20 10.2	-10 17.1	+1.1089	0.5042	0.2085	+83	+25
B. Virginis	5.3	2.75	19.3	9 0 3	17 8 48.1	+ 1 59.6	+0.3737	0.5074	0.2020	+59	-19
B. Virginis	6.0	2.90	19.6	11 12.6	19 46.2	-11 21.1	+0.6336	0.5112	0.1947	+75	- 5
Virginis	5.6	+3.19	-19.4	-14 56.8	18 15 51.1	+ 8 8.9	+1.0115	0.5203	-0.1770	+75	+20
Virginis	5.6	3.27	19.2	15 46.3	21 46.0	-10 6.8	+0.8895	0.5234	0.1707	+74	+11
Virginis	6.1	3.28	19.0	15 21.7	22 19.4	- 9 34.4	+0.3426	0.5238	0.1701	+52	-20
G. Virginis	6.5	3.41	18.1	15 56.9	19 8 9.0	- 0 2.8	-0.6275	0.5294	0.1584	- 2	-84
H. Virginis	5.1	3.44	17.8	15 55.2	10 55.4	+ 2 38.4	-1.0924	0.5310	0.1549	-33	-90
H. Virginis	5.5	+3.50	-18.1	-17 49.4	13 8.8	+ 4 47.7	+0.6508	0.5324	-0.1519	+70	- 3

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Parallels.		
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.			Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
		$\Delta\alpha$	$\Delta\delta$		d	h	m						
231 G. Virginis	6.4	+3.52	-18.0	-18 12.6	19	13	57.3	+ 534.6	+0.9508	0.5329	-0.1508	+72	+16
236 G. Virginis	5.7	3.53	18.0	18 20.5	14	43.6	+ 619.4	+0.9789	0.5334	0.1498	+72	+18	
<i>\tau</i> Libræ	4.7	3.86	14.6	19 29.2	20	16	8.2	+ 654.8	-1.0946	0.5494	0.1100	-39	-90
147 B. Libræ	6.2	3.98	13.2	20 27.0	21	0	31.6	- 858.7	-0.9069	0.5545	0.0947	-27	-90
172 B. Libræ	5.9	4.02	12.6	20 44.9	3	58.8	- 538.7	-0.8993	0.5566	0.0881	-27	-90	
δ Scorpii	2.5	+4.16	-11.0	-22 23.5	13	47.4	+ 349.6	+0.1027	0.5621	-0.0684	+27	-33	
57 B. Scorpii	5.7	4.21	10.6	23 23.2	16	19.1	+ 616.0	+1.0030	0.5635	0.0631	+67	+22	
27 G. Scorpii	5.8	4.23	10.4	23 28.2	17	28.2	+ 722.7	+1.0210	0.5640	0.0607	+67	+24	
19 Scorpii	4.9	4.29	9.3	23 58.5	22	39.4	-11 37.2	+1.2730	0.5667	0.0496	+66	+60	
ρ Ophiuchi	4.7	4.28	8.6	23 15.7	22	0	48.9	- 932.3	+0.4066	0.5677	0.0449	+42	-16
126 B. Scorpii	6.1	+4.37	-7.2	-24 18.7	7	42.3	- 253.7	+1.2689	0.5707	-0.0295	+66	+60	
24 Ophiuchi	5.5	4.37	5.4	23 1.4	14	12.7	+ 322.5	-0.2480	0.5732	-0.0146	+ 3	-54	
39 Ophiuchi	5.1	4.46	3.4	24 12.0	23	10.6	-11 59.3	+0.9607	0.5758	+0.0063	+66	+19	
191 B. Ophiuchi	6.3	4.47	2.6	24 10.2	23	2	9.7	- 9 6.7	+0.9578	0.5766	0.0133	+66	+19
<i>b</i> Ophiuchi	4.3	4.47	2.5	24 6.1	2	41.8	- 835.8	+0.8926	0.5767	0.0146	+66	+14	
51 Ophiuchi	4.8	+4.47	-1.9	-23 54.0	4	49.2	- 633.1	+0.7160	0.5771	+0.0196	+65	+ 2	
52 Ophiuchi	6.4	4.41	-1.3	21 59.4	6	29.0	- 456.9	-1.2642	0.5774	0.0236	-66	-76	
4 Sagittarii	4.8	4.49	+1.2	23 48.6	16	42.4	+ 453.6	+1.0164	0.5786	0.0478	+66	+24	
21 G. Sagittarii	5.7	4.45	1.4	22 46.7	17	36.3	+ 545.6	-0.0214	0.5786	0.0499	+18	-40	
1 Sagittarii	5.2	4.49	2.4	23 43.1	21	41.6	+ 941.8	+1.1865	0.5788	0.0596	+66	+41	
14 Sagittarii	5.6	+4.42	+2.7	-21 44.1	22	47.2	+10 44.9	-0.8240	0.5788	+0.0622	-25	-90	
115 B. Sagittarii	5.7	4.40	5.2	21 27.9	24	8	40.5	- 343.9	-0.3752	0.5783	0.0850	+ 2	-63
121 B. Sagittarii	5.9	4.38	5.2	21 7.1	9	5.7	- 319.6	-0.7003	0.5783	0.0860	-15	-90	
128 B. Sagittarii	6.3	4.38	5.9	21 5.1	11	46.8	- 044.5	-0.4969	0.5780	0.0920	- 4	-73	
28 Sagittarii	5.6	4.42	6.1	22 28.6	12	11.6	- 020.6	+0.9917	0.5779	0.0929	+68	+21	
29 Sagittarii	5.3	+4.35	+6.4	-20 25.0	13	37.2	+ 1 1.7	-1.0177	0.5777	+0.0962	-35	-90	
30 Sagittarii	6.2	4.41	6.6	22 15.3	14	5.0	+ 128.6	+0.9395	0.5776	0.0972	+68	+17	
33 Sagittarii	5.8	4.38	6.9	21 27.6	15	25.3	+ 245.9	+0.2434	0.5775	0.1001	+37	-25	
36 Sagittarii	5.1	4.35	7.2	20 45.8	16	50.1	+ 4 7.7	-0.3370	0.5772	0.1032	+ 6	-60	
ξ Sagittarii	3.7	4.37	7.2	21 12.8	16	59.4	+ 416.7	+0.1477	0.5772	0.1036	+32	-31	
o Sagittarii	3.9	+4.38	+8.0	-21 51.6	19	54.3	+ 7 5.1	+1.1301	0.5767	+0.1099	+68	+33	
190 B. Sagittarii	5.4	4.30	8.2	19 25.0	21	27.5	+ 834.8	-1.2317	0.5763	0.1133	-54	-88	
π Sagittarii	3.0	4.34	8.4	21 9.2	22	3.6	+ 9 9.5	+0.6368	0.5762	0.1146	+64	- 3	
195 B. Sagittarii	6.3	4.31	8.3	19 55.9	22	5.6	+ 911.5	-0.6261	0.5762	0.1146	- 8	-85	
<i>d</i> Sagittarii	5.0	4.27	9.0	19 5.8	25	1	24.8	-11 36.6	-1.0972	0.5754	0.1216	-39	-90
226 B. Sagittarii	6.4	+4.27	+9.5	-19 23.2	3	5.7	- 959.4	-0.5904	0.5751	+0.1251	- 5	-81	
266 B. Sagittarii	6.1	4.22	10.8	19 1.9	9	23.3	- 355.6	-0.1277	0.5734	0.1378	-21	-47	
267 B. Sagittarii	5.8	4.21	10.8	18 24.7	9	39.8	- 339.7	-0.7309	0.5733	0.1384	-12	-90	
57 Sagittarii	6.0	4.18	12.2	19 15.0	16	7.5	+ 233.9	+1.0693	0.5714	0.1508	+71	+26	
16 B. Capricorni	6.2	3.99	14.0	15 2.4	26	4	30.9	- 929.4	-1.2554	0.5672	0.1724	-49	-89
β Capricorni	3.2	+3.99	+14.0	-15 2.2	4	37.0	- 923.6	-1.2408	0.5671	+0.1726	-47	-90	
31 B. Capricorni	6.4	3.98	14.8	16 0.6	7	58.2	- 6 9.6	+0.3446	0.5659	0.1780	+51	-20	
27 G. Capricorni	6.2	3.95	14.8	15 19.6	9	0.2	- 5 9.6	-0.1698	0.5656	0.1796	+23	-49	
45 B. Capricorni	6.1	3.92	14.8	14 0.0	10	22.9	- 349.9	-1.2814	0.5651	0.1817	-51	-86	
τ Capricorni	5.2	3.92	15.4	15 14.3	12	35.8	- 141.7	-0.3943	0.5643	0.1850	+55	-18	
84 B. Capricorni	6.0	+3.84	+15.8	-12 50.7	17	39.0	+ 310.9	-1.1022	0.5625	+0.1922	-31	-90	
ν Aquarii	4.5	3.74	16.7	11 42.0	27	2	3.0	+11 17.2	-0.6091	0.5596	0.2030	+ 2	-81
51 G. Aquarii	6.5	3.70	16.8	10 56.4	4	9.1	-10 41.0	-0.9541	0.5589	0.2055	-18	-90	
19 Aquarii	5.6	3.64	17.1	10 5.6	9	3.7	- 556.6	-0.7941	0.5574	0.2109	- 7	-90	
72 B. Aquarii	6.5	3.65	17.8	11 55.1	10	24.0	- 439.1	+1.3488	0.5569	0.2123	+78	+67	
<i>\epsilon'</i> Capricorni	5.3	+3.54	+18.1	- 9 27.3	17	59.9	+ 241.3	+0.4795	0.5548	+0.2194	+66	-14	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y'	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ' "	d h m	h m				° ' "	° ' "
Capricorni	6.3	+3.52	+18.2	-9 39.0	27 18 34.2	+3 14.4	+0.8040	0.5546	+0.2199	+80	+5
Aquarii	5.6	3.42	18.2	6 54.8	28 2 19.5	+10 44.0	-0.2485	0.5527	0.2258	+24	-53
B. Aquarii	6.4	3.36	18.0	5 7.2	6 39.7	-9 4.6	-1.0839	0.5518	0.2286	-24	-90
Aquarii	5.7	3.34	18.4	5 47.5	8 39.6	-7 8.8	+0.0556	0.5514	0.2297	+41	-36
Aquarii	5.8	3.30	18.4	5 14.8	11 52.4	-4 2.4	+0.2437	0.5509	0.2313	+52	-26
B. Aquarii	6.3	+3.24	+18.0	-3 19.6	15 11.3	-0 50.2	-0.9353	0.5504	+0.2327	-13	-90
Aquarii	5.2	3.23	18.6	4 38.8	18 9.0	+2 1.5	+1.0936	0.5501	0.2338	+85	+24
B. Aquarii	6.3	3.21	18.5	3 58.5	19 33.1	+3 22.8	+0.7419	0.5500	0.2343	+86	+1
Piscium	6.3	3.10	17.7	-0 15.0	29 4 42.0	-11 46.7	-0.8795	0.5494	0.2362	-9	-90
Piscium	4.9	2.96	17.6	+0 48.7	16 48.8	-0 4.2	+0.9085	0.5497	0.2359	+90	+11
Piscium	6.4	+2.96	+17.7	+0 40.6	16 57.6	+0 4.3	+1.0791	0.5497	+0.2358	+90	+23
Piscium	5.7	2.91	17.5	1 39.1	21 10.1	+4 8.3	+1.0836	0.5501	0.2350	+90	+23
Piscium	5.4	2.86	17.0	3 2.2	30 1 45.3	+8 34.4	+0.7576	0.5506	0.2337	+90	+2
Piscium	4.0	2.81	15.7	6 24.8	7 39.4	-9 43.4	-1.2866	0.5516	0.2312	+43	-84
Piscium	6.2	2.72	15.2	7 47.4	15 30.5	-2 8.4	-0.8786	0.5534	0.2268	-9	-82
Piscium	5.4	+2.70	+15.2	+7 44.4	17 20.0	-0 22.6	-0.4152	0.5538	+0.2256	+17	-62

JULY.

B. Piscium	6.5	+2.61	+14.4	+8 54.7	1 2 36.5	+8 34.8	+0.4589	0.5566	+0.2183	+68	-12
Piscium	6.3	+2.52	+12.8	+12 31.2	13 51.9	+4 33.2	-0.7971	0.5607	+0.2069	+5	-77
Piscium	3.7	2.43	11.3	14 55.6	2 0 45.7	+5 57.6	-1.0519	0.5652	0.1933	-22	-75
Piscium	6.2	2.41	11.4	14 14.8	2 37.7	+7 45.6	-0.0039	0.5660	0.1907	+39	-33
B. Arietis	6.5	2.31	9.3	17 38.5	16 18.6	-3 3.1	-0.9806	0.5722	0.1694	-18	-72
H ¹ . Arietis	6.4	2.30	9.5	16 50.6	16 59.8	-2 23.4	-0.0537	0.5725	0.1682	+36	-33
Arietis	6.4	+2.22	+8.6	+17 20.6	3 2 2.9	+6 19.6	+0.8880	0.5766	+0.1519	+90	+20
Arietis	5.7	2.20	7.5	19 39.9	6 47.8	+10 53.9	-0.7719	0.5786	0.1427	+5	-70
Arietis	5.8	2.16	6.7	20 20.6	13 16.4	-6 52.0	-0.5801	0.5813	0.1295	+7	-61
Arietis (mean)	4.6	2.15	6.5	21 0.9	13 44.4	-6 25.1	-1.2048	0.5815	0.1285	-40	-69
Arietis	4.5	2.10	6.4	19 25.2	18 50.2	-1 30.9	+1.0485	0.5834	0.1176	+90	+35
Arietis	5.0	+2.09	+5.9	+20 44.6	20 9.9	-0 14.2	-0.1467	0.5839	+0.1147	+31	-33
Arietis	5.2	2.08	5.6	20 51.2	22 44.3	+2 14.3	+0.0280	0.5848	0.1090	+41	-23
Arietis	5.2	2.06	5.7	20 27.1	23 22.0	+2 50.5	+0.5066	0.5850	0.1075	+73	+2
Arietis	6.0	2.06	5.6	20 30.9	4 0 2.8	+3 29.8	+0.5145	0.5852	0.1060	+74	+3
H ¹ . Tauri	6.5	2.02	5.0	20 39.1	5 56.7	+9 10.1	+0.9620	0.5870	0.0924	+90	+31
H ¹ . Tauri	6.1	+2.00	+4.8	+20 40.3	8 9.0	+11 17.3	+1.1391	0.5876	+0.0872	+90	+46
B. Tauri	5.9	2.00	4.2	21 59.8	10 19.8	-10 36.9	-0.0309	0.5881	0.0820	+37	-24
Tauri	5.8	1.98	3.8	22 14.6	13 7.2	-7 56.1	-0.0642	0.5887	0.0753	+35	-25
Tauri	6.0	1.99	3.7	22 56.4	13 11.5	-7 51.8	-0.7708	0.5887	0.0752	-5	-67
B. Tauri	6.5	1.98	3.5	22 58.3	14 45.1	-6 21.9	-0.6898	0.5890	0.0714	0	-65
Tauri	4.5	+1.96	+3.6	+21 51.6	16 16.0	-4 54.5	+0.5542	0.5893	+0.0677	+78	+9
Tauri	6.1	1.96	3.5	21 47.4	16 31.3	-4 39.8	+0.6434	0.5893	0.0671	+88	+14
B. Tauri	6.1	1.93	3.2	22 12.3	19 32.1	-1 46.0	+0.4095	0.5898	0.0596	+66	+2
Tauri	5.2	1.91	3.0	21 34.6	22 15.0	+0 50.6	+1.2060	0.5901	0.0529	+90	+56
Tauri	4.1	1.90	2.7	22 6.5	5 0 32.6	+3 2.9	+0.7766	0.5903	0.0471	+90	+24
Tauri	5.4	+1.90	+2.7	+22 0.9	0 33.8	+3 4.0	+0.8739	0.5903	+0.0471	+90	+30
Tauri	4.2	1.91	2.5	22 37.8	0 54.7	+3 24.2	+0.2586	0.5904	0.0462	+55	-5
Tauri	5.4	1.90	2.4	22 48.8	1 18.4	+3 46.9	+0.0878	0.5904	0.0452	+44	-14
B. Tauri	6.0	1.89	1.9	23 10.5	4 58.6	+7 18.5	-0.1345	0.5905	0.0360	+31	-25
Tauri	4.3	1.86	1.8	22 48.1	7 17.3	+9 31.8	+0.3261	0.5905	0.0302	+60	0
Tauri	6.2	+1.88	+1.5	+23 56.1	7 39.9	+9 53.6	-0.8291	0.5905	+0.0282	-10	-66

ELEMENTS FOR THE PREDICTION OF ECLIPSES.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>		
		$\Delta\alpha$	$\Delta\delta$										
		<i>s</i>	<i>"</i>	<i>s</i>	<i>d</i>	<i>h</i>	<i>m</i>	<i>h</i>	<i>m</i>	<i>s</i>	<i>s</i>	<i>s</i>	<i>s</i>
300 B. Tauri	6.2	+1.86	+1.5	+23 28.7	5	8 39.8	+10 51.1	-0.3324	0.5905	+0.0267	+20	-36	
315 B. Tauri	6.3	1.86	0.9	24 27.7		12 52.5	-9 6.0	-1.2562	0.5903	0.0160	-55	-66	
99 Tauri	6.0	1.84	0.9	23 49.3		13 30.3	-8 29.7	-0.5865	0.5902	0.0144	+6	-53	
103 Tauri	5.5	1.82	+0.4	24 9.5		17 37.9	-4 31.6	-0.8964	0.5897	+0.0039	-14	-66	
NEW MOON.													
α Cancr	4.3	+1.62	-9.0	+12 10.4	9	22 16.5	-3 27.3	+1.2036	0.5342	-0.1869	+90	+39	
209 B. Cancr	6.5	1.64	9.4	11 53.8	10	3 51.2	+1 56.9	+0.4460	0.5307	0.1922	+67	-11	
222 B. Cancr	6.3	1.66	9.7	11 50.6		7 53.2	+5 51.5	-0.2785	0.5283	0.1957	+24	-51	
ω Leonis	5.5	1.67	10.4	9 24.7		13 15.0	+11 3.5	+1.2893	0.5252	0.1999	+88	+47	
<i>h</i> Leonis	5.2	+1.68	-10.4	+10 4.5		15 1.5	-11 13.2	+0.2156	0.5241	-0.2012	+52	-25	
<i>o</i> Leonis	3.8	1.70	10.6	10 15.8		19 43.6	-6 39.6	-0.9424	0.5216	0.2043	-14	-80	
89 B. Leonis	6.2	1.75	11.4	8 42.2	11	4 31.5	+1 52.7	-1.0698	0.5173	0.2092	-22	-81	
π Leonis	4.9	1.75	11.5	8 26.1		5 37.1	+2 56.4	-1.0079	0.5167	0.2097	-18	-82	
14 Sextantis	6.3	1.76	12.2	6 0.5		9 5.2	+6 18.5	+0.9054	0.5152	0.2113	+90	+12	
19 Sextantis	5.9	+1.78	-12.6	+5 1.0		12 15.9	+9 23.6	+1.3150	0.5139	-0.2125	+87	+48	
155 B. Leonis	6.5	1.81	12.5	6 6.4		17 48.0	-9 13.8	-1.0571	0.5118	0.2143	-21	-84	
237 B. Leonis	6.3	1.92	14.3	1 27.4	12	9 23.3	+5 55.1	+0.6729	0.5071	0.2171	+86	-3	
55 Leonis	6.1	1.94	14.4	1 10.2		11 16.2	+7 44.8	+0.5786	0.5066	0.2172	+77	-8	
<i>p</i> ³ Leonis	6.1	1.96	14.6	0 26.2		15 34.3	+11 55.8	+0.4508	0.5057	0.2172	+67	-15	
<i>p</i> ⁵ Leonis	5.3	+2.01	-14.8	+0 22.4		21 6.0	-6 41.8	-0.6791	0.5049	-0.2170	+3	-87	
388 B. Leonis	6.3	2.08	15.4	-1 15.2	13	4 49.6	+0 48.9	-0.5614	0.5041	0.2160	+9	-75	
<i>e</i> Leonis	5.1	2.10	15.8	2 33.3		6 9.0	+2 6.0	+0.5899	0.5040	0.2158	+77	-8	
431 B. Leonis	6.2	2.14	15.6	1 59.2		10 34.4	+6 24.1	-0.9900	0.5038	0.2148	-17	-90	
13 B. Virginis	5.9	2.21	16.5	4 52.9		17 29.2	-10 52.6	+0.7299	0.5038	0.2128	+85	0	
64 B. Virginis	6.5	+2.32	-17.2	-7 19.4	14	4 4.8	-0 34.6	+1.1978	0.5047	-0.2085	+83	+33	
η Virginis	5.3	2.47	17.6	9 0.3		16 43.0	+11 42.3	+0.4649	0.5070	0.2017	+65	-14	
370 B. Virginis	6.0	2.61	17.9	11 12.6	15	3 42.8	-1 36.6	+0.7261	0.5100	0.1941	+79	0	
<i>i</i> Virginis	5.7	2.84	17.3	12 17.2		20 44.9	-9 6.0	-1.2701	0.5164	0.1794	-47	-89	
75 Virginis	5.6	2.91	18.0	14 56.8		23 54.4	-6 4.1	+1.1045	0.5179	0.1762	+75	+27	
83 Virginis	5.6	+3.00	-17.9	-15 46.3	16	5 52.1	-0 12.9	+0.9816	0.5207	-0.1699	+74	+18	
85 Virginis	6.1	3.00	17.7	15 21.6		6 25.8	+0 19.8	+0.4332	0.5210	0.1693	+58	-15	
214 G. Virginis	6.5	3.15	17.0	15 56.9		16 20.6	+9 56.6	-0.5415	0.5261	0.1576	+2	-75	
40 H. Virginis	5.1	3.19	16.7	15 55.2		19 8.5	-11 20.7	-1.0085	0.5276	0.1540	-27	-90	
43 H. Virginis	5.5	3.25	17.1	17 49.4		21 23.3	-9 10.0	+0.7392	0.5289	0.1511	+72	+2	
231 G. Virginis	6.4	+3.27	-17.1	-18 12.6		22 12.3	-8 22.6	+1.0398	0.5294	-0.1500	+72	+23	
236 G. Virginis	5.7	3.28	17.1	18 20.5		22 59.0	-7 37.3	+1.0677	0.5298	0.1490	+72	+25	
ι Libræ	4.7	3.68	14.0	19 29.2	18	0 39.8	-6 45.8	-1.0213	0.5453	0.1096	-33	-90	
25 Libræ	6.0	3.68	13.8	19 20.6		1 10.6	-6 16.0	-1.2326	0.5456	0.1087	-53	-88	
147 B. Libræ	6.2	3.82	12.8	20 27.0		9 8.4	+1 25.9	-0.8370	0.5505	0.0945	-22	-90	
172 B. Libræ	5.9	+3.88	-12.3	-20 44.9		12 37.7	+4 48.1	-0.8311	0.5527	-0.0880	-23	-90	
δ Scorp	2.5	4.06	10.9	22 23.5		22 31.9	-9 38.0	+0.1676	0.5585	0.0685	+30	-29	
57 B. Scorp	5.7	4.12	10.6	23 23.2	19	1 4.9	-7 10.3	+1.0679	0.5599	0.0633	+67	+28	
27 G. Scorp	5.8	4.14	10.4	23 28.2		2 14.5	-6 3.1	+1.0852	0.5606	0.0609	+67	+29	
ρ Ophiuchi	4.7	4.23	8.7	23 15.7		9 38.7	+1 5.5	+0.4647	0.5645	0.0452	+46	-13	
24 Ophiuchi	5.5	+4.38	-5.5	-23 1.4		23 7.1	-9 55.1	-0.1998	0.5709	-0.0153	+5	-51	
39 Ophiuchi	5.1	4.50	3.6	24 12.0	20	8 6.8	-1 15.2	+1.0011	0.5743	+0.0655	+66	+23	
191 B. Ophiuchi	6.3	4.53	2.8	24 10.2		11 6.2	+1 37.6	+0.9954	0.5753	0.0125	+66	+22	
<i>b</i> Ophiuchi	4.3	4.54	2.7	24 6.1		11 38.3	+2 8.6	+0.9300	0.5754	0.0138	+66	+17	
51 Ophiuchi	4.8	4.55	2.0	23 54.1		13 45.8	+4 11.4	+0.7516	0.5761	0.0188	+66	+5	
52 Ophiuchi	6.4	+4.50	-1.2	-21 59.4		15 25.7	+5 47.6	-1.2268	0.5765	+0.0227	-61	-86	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.			Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d	h	m						
		s	"	°	'		h	m				°	'
Sagittarii	4.8	+4.63	+1.1	23 48.6	21	1 38.2	-8 22.6	+1.0401	0.5788	+0.0470	+66 +26		
i. Sagittarii	5.7	4.60	1.5	22 46.7		2 32.0	-7 30.8	+0.0044	0.5790	0.0491	+19 -39		
i. Sagittarii	6.2	4.57	2.3	21 27.2		4 45.2	-5 22.5	-1.2670	0.5793	0.0544	-65 -76		
Sagittarii	5.2	4.66	2.4	23 43.1		6 36.3	-3 35.6	+1.2044	0.5795	0.0587	+66 +43		
Sagittarii	5.6	4.60	3.0	21 44.1		7 41.6	-2 32.7	-0.8001	0.5797	0.0613	-24 -90		
3. Sagittarii	5.7	+4.63	+5.6	-21 27.9		17 31.1	+6 54.7	-0.3618	0.5802	+0.0843	+3 -62		
3. Sagittarii	5.9	4.62	5.8	21 7.1		17 56.2	+7 18.8	-0.6857	0.5802	0.0853	-15 -90		
3. Sagittarii	6.3	4.64	6.5	21 5.0		20 36.0	+9 52.7	-0.4858	0.5802	0.0914	-3 -72		
Sagittarii	5.6	4.68	6.5	22 28.6		21 0.4	+10 16.2	+0.9948	0.5802	0.0923	+68 +21		
Sagittarii	5.3	4.62	7.1	20 25.0		22 25.2	+11 37.8	-1.0056	0.5802	0.0956	-34 -90		
Sagittarii	6.2	+4.68	+7.0	-22 15.3		22 52.9	-11 55.5	+0.9408	0.5802	+0.0966	+68 +17		
Sagittarii	5.8	4.66	7.4	21 27.5	22	0 12.3	-10 39.2	+0.2471	0.5801	0.0996	+37 -25		
Sagittarii	5.1	4.64	7.8	20 45.7		1 36.3	-9 18.2	-0.3315	0.5800	0.1027	+6 -60		
Sagittarii	3.7	4.65	7.8	21 12.8		1 45.5	-9 9.4	+0.1503	0.5800	0.1031	+32 -30		
Sagittarii	3.9	4.68	8.5	21 51.6		4 38.4	-6 22.9	+1.1236	0.5798	0.1095	+68 +32		
3. Sagittarii	5.4	+4.60	+9.1	-19 25.0		6 10.6	-4 54.3	-1.2251	0.5797	+0.1129	-53 -89		
Sagittarii	3.0	4.66	9.1	21 9.1		6 46.2	-4 20.0	+0.6310	0.5796	0.1142	+64 -3		
3. Sagittarii	6.3	4.62	9.2	19 55.9		6 48.2	-4 18.0	-0.6239	0.5796	0.1142	-8 -85		
Sagittarii	5.0	4.60	10.1	19 5.8		10 4.9	-1 8.6	-1.0950	0.5792	0.1214	-39 -90		
3. Sagittarii	6.4	4.61	10.6	19 23.1		11 44.4	+0 27.1	-0.5933	0.5790	0.1249	-5 -81		
3. Sagittarii	6.1	+4.60	+12.0	-19 1.9		17 56.5	+6 25.4	-0.1404	0.5780	+0.1379	+20 -47		
3. Sagittarii	5.8	4.58	12.1	18 24.6		18 12.7	+6 41.0	-0.7393	0.5779	0.1384	-12 -90		
Sagittarii	6.0	4.59	13.6	19 15.0	23	0 34.0	-11 11.7	+1.0395	0.5766	0.1510	+71 +23		
3. Capricorni	6.2	4.45	16.3	15 2.4		12 43.2	+0 30.8	-1.2781	0.5735	0.1732	-52 -86		
Capricorni	3.2	4.45	16.3	15 2.2		12 49.2	+0 36.5	-1.2637	0.5735	0.1734	-50 -88		
3. Capricorni	6.4	+4.46	+17.0	-16 0.5		16 6.1	+3 46.2	+0.3026	0.5726	+0.1789	+49 -22		
i. Capricorni	6.2	4.44	17.1	15 19.6		17 6.8	+4 44.7	-0.2079	0.5723	0.1806	+21 -51		
3. Capricorni	6.1	4.41	17.4	13 59.9		18 27.6	+6 2.6	-1.3098	0.5719	0.1827	-57 -80		
Capricorni	5.2	4.43	17.8	15 14.3		20 37.6	+8 7.9	+0.3466	0.5713	0.1862	+52 -20		
3. Capricorni	6.0	4.36	18.6	12 50.6	24	1 33.8	-11 6.6	-1.1400	0.5698	0.1936	-34 -90		
Aquarii	4.5	+4.29	+19.9	-11 41.9		9 45.7	-3 12.3	-0.6613	0.5674	+0.2047	-1 -86		
i. Aquarii	6.5	4.26	20.1	10 56.4		11 48.6	-1 13.8	-1.0046	0.5668	0.2073	-22 -90		
Aquarii	5.6	4.22	20.6	10 5.6		16 35.8	+3 23.2	-0.8518	0.5654	0.2128	-11 -90		
3. Aquarii	6.5	4.24	21.1	11 55.1		17 54.0	+4 38.6	+1.2652	0.5650	0.2143	+78 +42		
3. Capricorni	6.2	4.19	21.7	10 56.4		22 50.8	+9 25.1	+1.3523	0.5637	0.2193	+73 +57		
Capricorni	5.3	+4.16	+21.8	-9 27.2	25	1 18.0	+11 47.0	+0.3975	0.5631	+0.2216	+60 -18		
Capricorni	6.3	4.15	21.9	9 38.9		1 51.4	-11 40.8	+0.7176	0.5630	0.2221	+80 0		
Aquarii	5.6	4.07	22.4	6 54.8		9 24.3	-4 23.7	-0.3309	0.5611	0.2282	-20 -58		
3. Aquarii	6.4	4.01	22.4	5 7.2		13 37.6	-0 19.2	-1.1611	0.5602	0.2310	-31 -90		
Aquarii	5.7	4.01	22.8	5 47.4		15 34.3	+1 33.5	-0.0369	0.5598	0.2322	-36 -41		
Aquarii	5.8	+3.98	+22.9	-5 14.8		18 42.0	+4 34.7	+0.1459	0.5592	+0.2338	+47 -31		
3. Aquarii	6.3	3.94	22.8	3 19.5		21 55.7	+7 41.7	-1.0228	0.5587	0.2353	-20 -90		
Aquarii	5.2	3.92	23.2	4 38.7	26	0 48.7	+10 28.7	+0.9803	0.5583	0.2364	+85 +16		
3. Aquarii	6.3	3.91	23.2	3 58.5		2 10.6	+11 47.9	+0.6312	0.5581	0.2368	+81 -5		
i. Piscium	6.2	3.84	23.4	2 49.7		10 1.2	-4 37.8	+1.3478	0.5572	0.2385	+81 +52		
Piscium	6.3	+3.82	+22.9	-0 14.9		11 5.7	-3 35.5	-0.9803	0.5571	+0.2387	-16 -90		
3. Piscium	6.4	3.73	23.2	-0 9.1		21 23.4	+6 21.0	+1.3821	0.5567	0.2384	+70 +63		
Piscium	4.9	3.72	22.9	+0 48.8		22 55.3	+7 49.8	+0.7798	0.5567	0.2382	+90 +3		
Piscium	6.4	3.72	23.0	+0 40.7		23 3.8	+7 58.0	+0.9485	0.5567	0.2381	+90 +14		
Piscium	5.7	3.68	22.8	1 39.2	27	3 10.9	+11 56.5	+0.9506	0.5568	0.2372	+90 +14		
Piscium	5.4	+3.64	+22.4	+3 2.3		7 40.3	-7 43.3	+0.6252	0.5570	+0.2357	+81 -5		

ELEMENTS FOR THE PREDICTION OF ECLIPSATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN E. A.					Time of Ecl. Astr.
Name.	Mag.	Red'n from 1918		Apparent Declina- tion	Greenwich Mean Time.	Hour Angle H	F	F'	F''	N. S.
		$\Delta\alpha$	$\Delta\delta$							
36 Piscium	6.2	-3.54	-20.5	7 47.4	27 10.4	-518.9	-1.0047	0.5584	-0.0284	-15-2
d Piscium	5.4	3.52	20.7	7 44.4	22 58.1	-7 2.9	-0.5457	0.5588	0.0272	-10-7
136 B. Piscium	6.5	3.44	19.9	5 54.5	28 5 6.7	-5 7.6	-0.5196	0.5606	0.0158	-58-3
75 Piscium	6.3	3.37	18.1	12 31.3	19 15.1	-237.4	-0.9325	0.5635	0.0277	-14-7
n Piscium	3.7	3.30	16.3	14 55.7	29 6 4.7	-10 56.1	-1.1584	0.5694	0.1938	-35-5
101 Piscium	6.2	-3.28	-16.4	-14 14.5	7 56.2	-9 5.6	-0.1451	0.5676	-0.1920	-31-4
47 B. Arietis	6.5	3.19	13.5	17 38.6	21 36.4	-4 1.9	-1.1176	0.5715	0.1686	-29-2
29 H. Arietis	6.4	3.18	14.0	16 50.6	22 17.7	-441.5	-0.1968	0.5717	0.1681	-28-4
27 Arietis	6.4	3.09	12.5	17 20.7	30 7 22.7	-10 33.2	-0.7545	0.5748	0.1317	-40-2
u Arietis	5.7	3.08	11.4	19 40.9	12 9.4	-5 57.1	-0.9059	0.5761	0.1424	-14-3
49 Arietis	6.0	-3.03	-11.7	-17 56.5	14 44.8	-3 27.5	-1.2066	0.5769	-0.1373	-20-4
47 Arietis	5.8	3.04	10.3	20 20.6	18 41.2	-500.2	-0.7115	0.5781	0.1292	-1-7
d Arietis	4.5	2.96	9.9	19 25.2	31 0 15.3	-0.44	-0.9252	0.5788	0.1173	-90-2
r Arietis	5.0	2.96	9.2	20 44.6	1 35.8	-7 2.1	-0.2753	0.5800	0.1144	-24-4
r Arietis	5.2	2.94	8.5	20 51.3	4 15.0	-9 32.4	-0.6966	0.5806	0.1087	-34-3
63 Arietis	5.2	-2.92	-5.9	-20 27.1	4 53.1	-10 9.0	-0.3844	0.5808	-0.1073	-64-4
65 Arietis	6.0	2.92	5.5	20 30.9	5 34.5	-10 45.5	-0.3927	0.5809	0.1058	-64-3
14 H. Tauri	6.5	2.86	7.9	20 39.1	11 33.0	-7 26.3	-0.8455	0.5822	0.0923	-90-24
22 H. Tauri	6.1	2.84	7.6	20 40.4	13 47.1	-517.1	-1.0261	0.5826	0.0871	-90-3
133 B. Tauri	5.9	2.84	6.5	21 59.5	15 59.5	-3 9.5	-0.1482	0.5830	0.0820	-30-3
32 Tauri	5.5	-2.82	-6.2	-22 14.7	18 49.7	-0 26.1	-0.1797	0.5834	-0.0753	-29-31
33 Tauri	6.0	2.83	6.0	22 56.4	18 54.2	-0 21.7	-0.8901	0.5834	0.0752	-14-6
161 B. Tauri	6.5	2.82	5.8	22 58.3	20 29.2	-1 9.7	-0.8076	0.5836	0.0714	-5-6
A Tauri	4.5	2.75	5.9	21 51.6	22 1.5	-2 35.4	-0.4446	0.5838	0.0677	-68-3
39 Tauri	6.1	-2.78	-5.9	-21 47.4	22 17.1	-2 53.5	-0.5346	0.5838	-0.0671	-76-5

AUGUST.

192 B. Tauri	6.1	-2.75	-5.3	-22 12.3	1 1 20.9	-5 50.2	-0.3015	0.5841	-0.0586	-58-4
56 Tauri	5.2	2.71	5.1	21 34.7	4 6.4	-8 29.4	-1.1056	0.5842	0.0531	-90-46
κ Tauri	4.1	-2.70	-4.6	-22 6.5	6 26.5	-10 44.2	-0.6755	0.5843	-0.0475	-90-18
67 Tauri	5.4	2.70	4.6	22 0.9	6 27.7	-10 45.3	-0.7734	0.5843	0.0474	-90-23
v Tauri	4.2	2.70	4.4	22 37.9	6 48.9	-11 5.7	-0.1545	0.5844	0.0466	-48-11
72 Tauri	5.4	2.70	4.3	22 48.8	7 13.1	-11 29.0	-0.0177	0.5844	0.0456	-38-20
284 B. Tauri	6.0	2.68	3.6	23 10.5	10 57.2	-8 55.5	-0.2377	0.5844	0.0365	-25-31
r Tauri	4.3	-2.64	-3.4	-22 48.1	13 19.5	-6 39.6	-0.2251	0.5843	-0.0307	-53-5
95 Tauri	6.2	2.66	2.9	23 56.1	13 41.5	-6 17.5	-0.9345	0.5843	0.0298	-17-66
300 B. Tauri	6.2	2.64	3.0	23 28.8	14 42.5	-5 15.8	-0.4337	0.5843	0.0273	-14-43
99 Tauri	6.0	2.60	2.1	23 49.3	19 38.4	-0 34.2	-0.6853	0.5839	0.0152	-1-62
164 Tauri	5.5	2.56	1.4	24 9.5	23 50.7	-3 28.5	-0.9936	0.5833	-0.0049	-22-66
108 Tauri	6.2	-2.49	-1.5	-22 11.5	2 2 53.2	-6 24.2	-1.0549	0.5829	-0.0026	-90-46
n Tauri	5.1	2.47	1.3	22 0.8	4 27.2	-7 54.6	-1.2352	0.5826	0.0064	-54-63
121 Tauri	5.1	2.45	0.1	23 59.2	11 4.9	-9 42.7	-0.9177	0.5811	0.0024	-16-66
175 H. Tauri	6.5	2.40	0.2	22 37.2	13 50.3	-7 34.7	-0.4380	0.5803	0.0280	-68-7
364 B. Tauri	6.0	2.40	0.4	23 10.0	14 21.1	-6 33.5	-0.1473	0.5801	0.0302	-31-25
141 Tauri	6.3	-2.32	-1.3	-22 24.0	22 0.7	-0 48.6	-0.3550	0.5777	-0.0482	-63 0
1 Geminorum	4.5	2.33	1.6	23 16.1	23 0.8	-1 46.5	-0.6051	0.5773	0.0505	-4-57
14 B. Geminorum	6.0	2.29	1.6	22 12.2	1 18.3	-3 58.9	-0.3900	0.5764	0.0557	-64+1
3 Geminorum	5.6	2.31	1.8	23 7.6	1 22.3	-4 2.7	-0.5832	0.5764	0.0558	-6-56
6 Geminorum	6.3	2.29	2.0	22 55.7	2 27.7	-5 5.7	-0.4358	0.5760	0.0583	-14-46
7 Gemin. Tar.	3.2	-2.27	-2.0	-22 31.9	3 33.0	-6 5.6	-0.0843	0.5755	-0.0606	-34-25

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Magn.	Red'n's from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>z</i>	<i>y</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
Geminorum	3.2	+2.25	-2.5	+22 33.4	3 6 57.7	+ 9 25.8	-0.3314	0.5741	-0.0684	+20	-40
JUPITER	-1.5	...	...	23 8.4	7 51.5	+10 17.6	-1.0078	0.5648	0.0701	-23	-67
3. Geminorum	6.0	2.26	2.8	23 22.4	8 3.0	+10 28.7	-1.2667	0.5736	0.0708	-56	-67
Geminorum	5.2	2.15	3.9	21 51.5	19 13.6	-2 45.0	-0.5987	0.5682	0.0945	+5	-60
Gemin. (var.)	3.7	2.09	4.3	20 41.4	4 0 43.0	+2 32.8	+0.0860	0.5653	0.1055	+44	-20
3. Geminorum	6.5	+2.08	-5.0	+21 23.4	3 21.0	+5 5.3	-0.9397	0.5638	-0.1106	-17	-69
NEW MOON.											
3. Leonis	6.3	+1.82	-12.8	+1 27.4	8 16 59.3	-8 41.2	+0.8108	0.5094	-0.2167	+90	+5
Leonis	6.1	1.83	12.9	1 10.2	18 51.7	-6 52.0	+0.7190	0.5090	0.2169	+90	0
Leonis	6.1	+1.84	-13.1	+0 26.2	23 8.8	-2 42.0	+0.5970	0.5082	-0.2170	+78	-7
Leonis	5.3	1.88	13.2	+0 22.4	9 4 39.2	+2 39.1	-0.5264	0.5072	0.2168	+11	-72
3. Leonis	6.3	1.92	13.7	-1 15.1	12 21.0	+10 8.0	-0.3991	0.5064	0.2158	+18	-63
Leonis	5.1	1.93	14.0	2 33.3	13 40.1	+11 24.8	+0.7546	0.5063	0.2155	+87	+2
3. Leonis	6.2	1.96	13.9	1 59.2	18 4.6	-8 17.9	-0.8214	0.5061	0.2146	-6	-90
3. Virginis	5.9	+2.00	-14.6	-4 52.9	10 0 58.1	-1 36.0	+0.9076	0.5059	-0.2126	+85	+11
3. Virginis	6.5	2.10	14.6	5 16.0	13 36.4	+10 41.1	-1.3201	0.5066	0.2072	-49	-86
Virginis	5.3	2.20	15.5	9 0.2	11 0 9.8	-3 3.2	+0.6638	0.5081	0.2013	+79	-3
3. Virginis	6.0	2.32	15.9	11 12.5	11 10.4	+7 38.7	+0.9332	0.5104	0.1936	+79	+13
Virginis	5.7	2.52	15.4	12 17.1	12 4 16.6	+0 15.4	-1.0613	0.5157	0.1786	-27	-90
Virginis	5.6	+2.58	-16.1	-14 56.8	7 27.3	+3 20.5	+1.3228	0.5168	-0.1754	+75	+55
B. Virginis	6.0	2.57	15.4	12 47.9	8 24.5	+4 16.0	-1.2224	0.5172	0.1745	-42	-90
Virginis	5.6	2.67	16.0	15 46.3	13 27.6	+9 10.2	+1.2012	0.5192	0.1691	+74	+37
Virginis	6.1	2.67	15.8	15 21.6	14 1.5	+9 43.1	+0.6507	0.5194	0.1685	+72	-3
3. Virginis	6.5	2.81	15.2	15 56.9	13 0 1.9	+4 34.5	-0.3275	0.5238	0.1567	+14	-59
H. Virginis	5.1	+2.85	-15.0	-15 55.2	2 51.6	-1 49.9	-0.7969	0.5251	-0.1531	-13	-90
H. Virginis	5.5	2.90	15.4	17 49.4	5 7.8	+0 22.1	+0.9596	0.5262	0.1502	+72	+17
3. Virginis	6.4	2.92	15.4	18 12.5	5 57.4	+1 10.2	+1.2618	0.5266	0.1491	+72	+46
3. Virginis	5.7	2.93	15.4	18 20.4	6 44.6	+1 56.0	+1.2899	0.5270	0.1481	+72	+52
Librae	4.7	3.32	12.8	19 29.2	14 8 47.6	+3 9.8	-0.8184	0.5406	0.1089	-19	-90
Librae	6.0	+3.32	-12.7	-19 20.6	9 19.0	+3 40.2	-1.0313	0.5409	-0.1080	-34	-90
B. Librae	6.2	3.47	11.8	20 27.0	17 25.1	+11 30.5	-0.6374	0.5453	0.0939	-10	-87
B. Librae	5.9	3.53	11.4	20 44.9	20 58.2	-9 3.6	-0.6335	0.5472	0.0875	-11	-86
Scorpii	2.5	3.72	10.2	22 23.5	15 7 3.6	+0 41.6	+0.3658	0.5526	0.0683	-42	-18
B. Scorpii	5.7	3.78	10.1	23 23.2	9 39.6	+3 12.2	+1.2706	0.5540	0.0632	+67	+58
Ophiuchi	4.7	+3.91	-8.3	-23 15.7	18 23.4	+11 38.0	+0.6560	0.5584	-0.0455	+61	-1
Ophiuchi	5.5	4.10	5.4	23 1.4	16 8 7.7	+0 53.4	-0.0263	0.5646	-0.0160	+15	-40
Ophiuchi	5.1	4.25	3.6	24 12.0	17 17.6	+9 43.6	+1.1725	0.5682	+0.0044	+66	+40
B. Ophiuchi	6.3	4.30	2.9	24 10.2	20 20.2	-11 20.4	+1.1632	0.5693	0.0113	+66	+39
Ophiuchi	4.3	4.30	2.8	24 6.1	20 52.9	-10 48.8	+1.0966	0.5695	0.0125	+66	+31
Ophiuchi	4.8	+4.32	-2.2	-23 54.1	23 2.8	-8 43.6	+0.9144	0.5701	+0.0175	+66	+16
Ophiuchi	6.4	4.28	-1.2	-21 59.4	17 0 44.4	-7 5.7	-1.0779	0.5707	0.0213	-46	-90
Sagittarii	4.8	4.46	+0.8	23 48.6	11 7.0	+2 54.1	+1.1884	0.5735	0.0453	+66	+41
3. Sagittarii	5.7	4.43	1.4	22 46.7	12 1.6	+3 46.8	+0.1460	0.5737	0.0473	+27	-31
3. Sagittarii	6.2	4.41	2.4	21 27.2	14 16.9	+5 57.1	-1.1345	0.5741	0.0525	-49	-90
Sagittarii	5.6	+4.45	+3.0	-21 44.1	17 15.8	+8 49.4	-0.6694	0.5747	+0.0594	-16	-90
B. Sagittarii	5.7	4.54	5.5	21 27.9	18 3 12.9	-5 35.5	-0.2434	0.5761	0.0822	+9	-54
B. Sagittarii	5.9	4.52	5.7	21 7.1	3 38.2	-5 11.1	-0.5691	0.5762	0.0831	-8	-79
B. Sagittarii	6.3	4.55	6.4	21 5.0	6 19.8	-2 35.5	-0.3724	0.5764	0.0892	+3	-62
Sagittarii	5.6	4.60	6.3	22 28.6	6 44.5	-2 11.7	+1.1119	0.5764	0.0901	+68	+32
Sagittarii	5.3	+4.54	+7.2	-20 25.0	8 10.2	-0 49.2	-0.8965	0.5766	+0.0934	-27	-9

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Par- allels.
	Name.	Mag.	Red'ns from 1918.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
			$\Delta\alpha$	$\Delta\delta$								
			<i>s</i>	<i>"</i>	<i>^{\circ}</i> <i>'</i>	<i>d</i> <i>h</i> <i>m</i>	<i>h</i> <i>m</i>				<i>^{\circ}</i> <i>'</i>	<i>^{\circ}</i> <i>'</i>
30	Sagittarii	6.2	+4.60	+6.8	-22 15.3	18 8 38.1	-0 22.3	+1.0547	0.5766	+0.0944	+68	-28
33	Sagittarii	5.8	4.59	7.3	21 27.5	9 58.3	+0 54.9	+0.3568	0.5766	0.0974	+44	-19
36	Sagittarii	5.1	4.58	7.8	20 45.7	11 23.0	+2 16.6	-0.2256	0.5767	0.1005	+12	-53
ξ	Sagittarii	3.7	4.59	7.8	21 12.8	11 32.3	+2 25.5	+0.2571	0.5767	0.1009	+38	-24
σ	Sagittarii	3.9	4.63	8.4	21 51.6	14 26.7	+5 13.5	+1.2276	0.5768	0.1073	+68	-45
190 B.	Sagittarii	5.4	+4.56	+9.3	-19 25.0	15 59.5	+6 42.8	-1.1284	0.5769	+0.1107	-42	-90
π	Sagittarii	3.0	4.62	9.0	21 9.2	16 35.4	+7 17.3	+0.7302	0.5768	0.1120	+69	+3
195 B.	Sagittarii	6.3	4.59	9.3	19 55.9	16 37.4	+7 19.3	-0.5270	0.5768	0.1120	-3	-75
<i>d</i>	Sagittarii	5.0	4.58	10.3	19 5.8	19 55.4	+10 30.0	-1.0042	0.5768	0.1191	-32	-90
226 B.	Sagittarii	6.4	4.60	10.7	19 23.1	21 35.5	-11 53.7	-0.5045	0.5768	0.1227	-1	-73
266 B.	Sagittarii	6.1	+4.62	+12.3	-19 1.9	19 3 49.2	-5 53.8	-0.0623	0.5765	+0.1357	+23	-42
267 B.	Sagittarii	5.8	4.60	12.5	18 24.6	4 5.4	-5 38.2	-0.6617	0.5765	0.1362	-8	-89
57	Sagittarii	6.0	4.65	13.8	19 15.0	10 27.4	+0 29.7	+1.1043	0.5760	0.1490	+71	-23
16 B.	Capricorni	6.2	4.58	17.2	15 2.4	22 35.1	-11 49.3	-1.2326	0.5746	0.1715	-46	-90
β	Capricorni	3.2	4.58	17.2	15 2.2	22 41.1	-11 43.6	-1.2184	0.5746	0.1717	-45	-90
31 B.	Capricorni	6.4	+4.61	+17.8	-16 0.5	20 1 56.9	-8 35.0	+0.3365	0.5741	+0.1773	+51	-20
27 G.	Capricorni	6.2	4.59	18.0	15 19.6	2 57.3	-7 36.8	-0.1743	0.5739	0.1790	+22	-49
45 B.	Capricorni	6.1	4.56	18.6	13 59.9	4 17.6	-6 19.4	-1.2747	0.5737	0.1812	-51	-87
τ	Capricorni	5.2	4.60	18.8	15 14.3	6 26.6	+4 15.1	+0.3707	0.5734	0.1847	+54	-19
84 B.	Capricorni	6.0	4.55	20.0	12 50.6	11 20.2	+0 27.8	-1.1192	0.5726	0.1924	-32	-90
γ	Aquarii	4.5	+4.53	+21.5	-11 41.9	19 26.4	+8 16.4	-0.6596	0.5713	+0.2039	-1	-86
51 G.	Aquarii	6.5	4.51	21.9	10 56.3	21 27.7	+10 13.3	-1.0049	0.5710	0.2066	-22	-90
19	Aquarii	5.6	4.50	22.6	10 5.5	2 10.6	-9 13.9	-0.8628	0.5702	0.2124	-12	-90
72 B.	Aquarii	6.5	4.53	22.8	11 55.1	3 27.6	-7 59.7	+1.2354	0.5700	0.2139	+78	-39
137 B.	Capricorni	6.2	4.50	23.6	10 56.4	8 19.3	-3 18.4	+1.3100	0.5693	0.2193	+79	-48
c^1	Capricorni	5.3	+4.48	+24.0	-9 27.2	10 43.7	-0 59.2	+0.3574	0.5689	+0.2217	+57	-20
c^2	Capricorni	6.3	4.48	24.1	9 38.9	11 16.6	-0 27.6	+0.6734	0.5688	0.2222	+79	-2
30	Aquarii	5.6	4.42	25.0	6 54.7	18 40.2	+6 40.3	-0.3819	0.5678	0.2287	+17	-62
138 B.	Aquarii	6.4	4.39	25.4	5 7.1	22 47.8	+10 39.0	-1.2124	0.5674	0.2317	-36	-90
44	Aquarii	5.7	4.40	25.6	5 47.4	22 0 41.8	-11 31.1	-0.1042	0.5672	0.2330	+32	-45
51	Aquarii	5.8	+4.38	+25.9	-5 14.7	3 45.0	-8 34.5	+0.0697	0.5669	+0.2348	+42	-35
187 B.	Aquarii	6.3	4.35	26.1	3 19.4	6 53.7	-5 32.4	-1.0925	0.5667	0.2364	-24	-90
κ	Aquarii	5.2	4.35	26.4	4 38.6	9 42.3	-2 49.8	+0.8811	0.5665	0.2377	+85	+10
207 B.	Aquarii	6.3	4.35	26.5	3 58.4	11 2.0	-1 32.9	+0.5332	0.5664	0.2382	+72	-10
6 G.	Piscium	6.2	4.31	26.8	2 49.6	18 39.7	+5 48.6	+1.2238	0.5661	0.2403	+87	+36
3	Piscium	6.3	+4.30	+26.7	-0 14.8	19 42.3	+6 48.9	-1.0767	0.5662	+0.2405	-23	-90
22 B.	Piscium	6.4	4.26	27.1	-0 9.1	5 41.8	-7 32.8	+1.2340	0.5663	0.2406	+90	+37
κ	Piscium	4.9	4.25	26.9	+0 48.8	7 10.9	-6 6.8	+0.6370	0.5664	0.2404	+82	-5
9	Piscium	6.4	4.25	27.0	0 40.8	7 19.2	-5 58.8	+0.8031	0.5664	0.2403	+90	+5
16	Piscium	5.7	4.22	26.9	1 39.3	11 18.6	-2 7.9	+0.7973	0.5666	0.2395	+90	+5
19	Piscium	5.4	+4.21	+26.7	+3 2.4	15 39.7	+2 3.9	+0.4683	0.5670	+0.2381	+68	-14
36	Piscium	6.2	4.16	25.6	7 47.5	24 4 44.2	-9 19.6	-1.1603	0.5686	0.2309	-30	-82
<i>d</i>	Piscium	5.4	4.16	25.5	7 44.5	6 28.5	-7 39.0	-0.7106	0.5688	0.2297	0	-82
136 B.	Piscium	6.5	4.11	24.7	8 54.9	15 19.9	+0 53.2	+0.1294	0.5704	0.2219	+46	-30
75	Piscium	6.3	4.09	23.0	12 31.4	25 2 8.0	+11 17.9	-1.1181	0.5728	0.2100	-26	-78
101	Piscium	6.2	+4.04	+21.2	+14 14.9	14 27.4	-0 49.9	-0.3522	0.5757	+0.1930	+20	-53
47 B.	Arietis	6.5	4.00	18.5	17 38.7	26 3 46.7	+11 59.7	-1.3246	0.5790	0.1709	-63	-68
20 H.	Arietis	6.4	3.99	18.5	16 50.7	4 27.0	-11 21.5	-0.4092	0.5791	0.1697	+16	-54
27	Arietis	6.4	3.92	17.0	17 20.8	13 20.1	-2 48.4	+0.5218	0.5812	0.1530	+73	-1
μ	Arietis	5.7	3.93	15.5	19 40.0	18 1.0	+1 42.0	-1.1228	0.5822	0.1436	-31	-70
36	Arietis	6.5	+3.87	+16.1	+17 25.3	18 50.3	+2 29.3	+1.2596	0.5823	+0.1419	+86	+54

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Par- allels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	T'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	"	d h m	h m				"	"
Arietis	6.0	+3.87	+15.7	+17 56.8	26 20 33.5	+ 4 8.6	+0.9710	0.5826	+0.1383	+90	+27
Arietis	5.8	3.90	14.2	20 20.7	27 0 25.8	+ 7 52.0	-0.9322	0.5833	0.1301	-16	-70
Arietis	4.5	3.82	13.6	19 25.3	5 57.6	-10 48.8	+0.6896	0.5842	0.1181	+90	+12
Arietis	5.0	3.83	12.8	20 44.7	7 17.0	- 9 32.4	-0.4989	0.5844	0.1152	+11	-55
Arietis	5.2	3.81	12.3	20 51.3	9 51.0	- 7 4.4	-0.3236	0.5847	0.1094	+21	-43
Arietis	5.2	+3.79	+12.4	+20 27.2	10 28.6	- 6 28.2	+0.1536	0.5848	+0.1080	+48	-16
Arietis	6.0	3.79	12.2	20 31.0	11 9.4	- 5 49.0	+0.1620	0.5848	0.1065	+48	-16
H ¹ Tauri	6.5	3.73	11.1	20 39.2	17 3.6	- 0 8.3	+0.6135	0.5853	0.0929	+84	+10
H ¹ Tauri	6.1	3.71	10.6	20 40.4	19 16.5	+ 1 59.5	+0.7928	0.5855	0.0877	+90	+21
B. Tauri	5.9	3.72	9.7	21 59.9	21 27.9	+ 4 5.8	-0.3734	0.5855	0.0826	+18	-44
Tauri	5.8	+3.70	+ 9.0	+22 14.7	28 0 16.3	+ 6 47.8	-0.4041	0.5856	+0.0759	+16	-45
Tauri	6.0	3.72	8.8	22 56.5	0 20.8	+ 6 52.1	-1.1104	0.5856	0.0757	-32	-67
B. Tauri	6.5	3.70	8.5	22 58.4	1 55.1	+ 8 22.9	-1.0281	0.5856	0.0720	-24	-67
Tauri	4.5	3.66	8.6	21 51.7	3 26.7	+ 9 51.0	+0.2178	0.5856	0.0683	+52	- 9
Tauri	6.1	3.66	8.6	21 47.5	3 42.2	+10 5.9	+0.3073	0.5856	0.0677	+58	- 5
B. Tauri	6.1	+3.63	+ 7.8	+22 12.3	6 44.8	-10 58.5	+0.0770	0.5855	+0.0603	+43	-16
Tauri	5.6	3.58	7.7	21 22.9	8 59.7	- 8 48.8	+1.0533	0.5853	0.0549	+90	+42
Tauri	5.2	3.58	7.5	21 34.7	9 29.5	- 8 20.1	+0.8786	0.5854	0.0537	+90	+29
Tauri	4.1	3.57	6.9	22 6.6	11 49.0	- 6 6.1	+0.4516	0.5851	0.0480	+69	+ 5
Tauri	5.4	3.57	6.9	22 0.9	11 50.2	- 6 4.9	+0.5492	0.5851	0.0480	+78	+10
Tauri	4.2	+3.58	+ 6.4	+22 37.8	12 11.4	- 5 44.5	-0.0671	0.5851	+0.0471	+35	-22
Tauri	5.4	3.58	6.6	22 48.9	12 35.4	- 5 21.3	-0.2378	0.5851	0.0461	+25	-32
B. Tauri	5.8	3.54	6.9	21 26.4	12 53.9	- 5 3.6	+1.1919	0.5850	0.0454	+90	+55
B. Tauri	6.0	3.55	5.6	23 10.5	16 18.8	- 1 46.5	-0.4558	0.5846	0.0371	+13	-45
Tauri	4.3	3.51	5.3	22 48.1	18 39.9	+ 0 29.2	+0.0099	0.5843	0.0313	+39	-17
Tauri	6.2	+3.53	+ 4.8	+23 56.1	19 2.9	+ 0 51.3	-1.1493	0.5842	+0.0304	-37	-66
B. Tauri	6.2	3.50	4.8	23 28.8	20 3.8	+ 1 49.9	-0.6493	0.5841	0.0279	+ 2	-59
Tauri	6.0	3.46	3.6	23 49.3	29 0 59.6	+ 6 34.5	-0.8975	0.5832	0.0159	-15	-66
Tauri	5.5	3.42	2.7	24 9.5	5 12.2	+10 37.4	-1.2029	0.5822	+0.0057	-44	-66
Tauri	6.2	3.33	2.8	22 11.6	8 15.1	-10 26.6	+0.8451	0.5815	-0.0017	+90	+32
Tauri	5.1	+3.31	+ 2.6	+22 0.8	9 49.5	- 8 55.8	+1.0267	0.5810	-0.0054	+90	+44
Tauri	4.8	3.27	2.0	21 52.1	13 16.5	- 5 36.6	+1.1464	0.5799	0.0137	+90	+53
Tauri	5.1	3.28	0.6	23 69.2	16 28.9	- 2 31.4	-1.1187	0.5789	0.0213	-34	-66
H ¹ Tauri	6.5	3.20	0.6	22 37.3	19 15.2	+ 0 8.7	+0.2389	0.5779	0.0278	+54	- 4
B. Tauri	6.0	3.22	+ 0.3	23 10.0	19 46.2	+ 0 38.5	-0.3460	0.5777	0.0290	+19	-37
Tauri	6.3	+3.10	- 0.9	+22 24.0	30 3 28.9	+ 8 4.2	+0.1643	0.5746	-0.0467	+48	-10
Geminorum	4.3	3.11	1.4	23 16.1	4 29.5	+ 9 2.5	-0.7960	0.5742	0.0490	- 8	-67
B. Geminorum	6.0	3.06	1.4	22 12.2	6 48.1	+11 16.1	+0.2030	0.5732	0.0542	+51	- 9
Geminorum	5.6	3.08	1.7	23 7.7	6 52.1	+11 19.9	-0.7716	0.5732	0.0543	- 6	-67
Geminorum	6.3	3.06	1.8	22 55.7	7 58.1	-11 36.5	-0.6228	0.5727	0.0567	+ 3	-59
Gemin. (var.)	3.2	+3.04	- 1.9	+22 31.9	9 3.9	-10 33.1	-0.2696	0.5722	-0.0592	+23	-35
Geminorum	3.2	3.01	2.6	22 33.4	12 30.5	- 7 14.0	-0.5132	0.5705	0.0666	+10	-52
Geminorum	6.5	2.94	2.3	20 50.4	14 36.3	- 5 12.7	+1.1520	0.5695	0.0711	+90	+49
Geminorum	5.2	2.84	4.3	21 51.5	31 0 54.1	+ 4 42.9	-0.7661	0.5642	0.0924	- 5	-68
Gemin. (var.)	3.7	2.75	4.8	20 41.4	6 27.3	+10 4.5	-0.0716	0.5612	0.1032	+35	-28
B. Geminorum	6.5	+2.74	- 5.7	+21 23.4	9 7.2	-11 21.1	-1.0972	0.5596	-0.1082	-30	-69
Geminorum	5.2	2.67	5.9	20 35.9	14 26.0	- 6 13.4	-0.8572	0.5566	0.1179	-11	-69
Geminorum	5.8	2.64	6.2	20 25.2	16 41.3	- 4 2.8	-0.9395	0.5554	0.1219	-16	-70
Geminorum	5.3	+2.54	- 6.2	+17 51.6	22 26.6	+ 1 30.9	+1.0655	0.5520	-0.1317	+90	+34

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS

SEPTEMBER

THE STAR'S					AT CONJUNCTION IN R. A.						
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'		
		$\Delta\alpha$	$\Delta\delta$								
		s	$"$	$^{\circ}$ $'$	d h m	h m					
<i>g</i> Geminorum	5.0	+2.52	-6.9	+18 42.6	1 1 29.7	+ 4 27.8	-0.2513	0.5502	-0.134		
2 B. Cancri	6.0	2.44	7.1	16 44.3	7 17.0	+10 3.7	+1.0447	0.5469	0.141		
3 Cancri	5.7	2.44	7.4	17 31.9	8 20.0	+11 4.7	+0.0395	0.5463	0.14		
5 Cancri	5.9	2.42	7.3	16 40.8	8 40.9	+11 24.8	+0.9030	0.5461	0.14		
ζ Cancri (<i>mean</i>)	4.7	2.40	8.2	17 53.6	13 42.9	- 7 43.0	-1.1631	0.5432	0.15		
29 Cancri	5.9	+2.29	-8.3	+14 28.8	21 37.1	- 0 4.0	+1.2477	0.5387	-0.16		
90 B. Cancri	6.3	2.28	8.9	15 35.7	2 1 14.5	+ 3 26.4	-0.5628	0.5367	0.11		
α Cancri	4.3	2.16	9.3	12 10.4	12 17.1	- 9 51.6	+1.1976	0.5309	0.11		
209 B. Cancri	6.5	2.12	9.8	11 53.8	17 56.4	- 4 22.8	+0.4545	0.5281	0.11		
222 B. Cancri	6.3	2.10	10.1	+11 50.5	22 1.4	- 0 25.2	-0.2602	0.5262	0.1		
NEW MOON.											
<i>g</i> Virginis	5.3	+2.04	-13.8	- 9 0.2	7 6 50.9	+ 5 25.4	+0.8522	0.5100	-0.2		
χ Virginis	4.8	2.06	13.5	7 32.9	9 47.5	+ 8 17.0	-1.3513	0.5105	0.1		
370 B. Virginis	6.0	2.12	14.0	11 12.5	17 50.9	- 7 53.3	+1.1409	0.5122	0.1		
ψ Virginis	5.0	+2.11	-13.6	- 9 5.9	17 52.3	- 7 51.9	-1.2092	0.5122	-0.1		
49 Virginis	5.2	2.17	13.6	10 18.4	8 1 3.6	- 0 52.8	-1.2298	0.5140	0.1		
<i>i</i> Virginis	5.7	2.25	13.6	12 17.1	10 57.5	+ 8 43.9	-0.8341	0.5169	0.1		
550 B. Virginis	6.0	2.29	13.5	12 47.9	15 5.9	-11 15.0	-0.9906	0.5183	0.1		
85 Virginis	6.1	2.37	13.8	15 21.6	20 43.7	- 5 47.1	+0.8956	0.5202	0.1		
214 G. Virginis	6.5	+2.48	-13.3	-15 56.8	9 6 46.6	+ 3 57.8	-0.0757	0.5240	-0.1		
40 H. Virginis	5.1	2.50	13.1	15 55.1	9 37.2	+ 6 43.3	-0.5446	0.5250	0.1		
43 H. Virginis	5.5	2.55	13.4	17 49.3	11 54.3	+ 8 56.3	+1.2219	0.5260	0.1		
ι Libræ	4.7	2.90	11.2	19 29.1	10 15.50	-11 59.9	-0.5486	0.5380	0.1		
25 Libræ	6.0	2.91	11.1	19 20.5	16 22.1	-11 29.1	-0.7629	0.5383	0.1		
147 B. Libræ	6.2	+3.04	-10.4	-20 27.0	11 0 35.3	- 3 31.7	-0.3641	0.5420	-0.0		
150 B. Libræ	6.1	3.03	10.2	19 53.3	1 7.7	- 3 0.4	-1.0317	0.5422	0.0		
172 B. Libræ	5.9	3.09	10.0	20 44.9	4 11.8	- 0 2.2	-0.3598	0.5436	0.0		
10 G. Scorpii	5.9	3.22	8.6	20 44.9	13 15.7	+ 8 43.8	-1.0663	0.5475	0.0		
δ Scorpii	2.5	3.26	9.0	22 23.5	14 28.1	+ 9 53.8	+0.6488	0.5480	0.0		
51 G. Scorpii	6.5	+3.34	-7.3	-21 6.2	22 8.6	- 6 41.2	-1.2198	0.5512	-0.0		
ρ Ophiuchi	4.7	3.45	7.4	23 15.6	12 2 1.9	- 2 55.8	+0.9412	0.5527	0.0		
24 Ophiuchi	5.5	3.64	4.8	23 1.4	16 5.6	+10 39.0	+0.2479	0.5579	-0.0		
51 Ophiuchi	4.8	3.87	2.0	23 54.0	13 7 24.0	+ 1 25.4	+1.1911	0.5624	+0.0		
52 Ophiuchi	6.4	3.84	0.9	21 59.4	9 8.4	+ 3 6.2	-0.8251	0.5629	0.0		
58 Ophiuchi	4.8	+3.87	-0.1	-21 38.7	12 42.4	+ 6 32.6	-1.1056	0.5637	+0.0		
21 G. Sagittarii	5.7	4.01	+1.3	22 46.7	20 44.4	- 9 42.5	+0.4037	0.5654	0.0		
30 G. Sagittarii	6.2	4.00	2.3	21 27.2	23 3.5	- 7 28.3	-0.8939	0.5659	0.0		
μ Sagittarii	4.0	4.02	3.1	21 4.8	14 1 55.0	- 4 43.0	-1.1324	0.5664	0.0		
14 Sagittarii	5.6	4.04	2.9	21 44.1	2 7.5	- 4 31.0	-0.4262	0.5664	0.0		
115 B. Sagittarii	5.7	+4.16	+5.3	-21 27.9	12 21.4	+ 5 20.9	-0.0062	0.5677	+0.0		
121 B. Sagittarii	5.9	4.15	5.4	21 7.1	12 47.4	+ 5 46.0	-0.3360	0.5678	0.0		
128 B. Sagittarii	6.3	4.18	6.2	21 5.1	15 33.5	+ 8 26.2	-0.1405	0.5680	0.0		
29 Sagittarii	5.3	4.18	6.9	20 25.0	17 26.9	+10 15.5	-0.6728	0.5682	0.0		
33 Sagittarii	5.8	4.23	6.9	21 27.6	19 18.0	-11 57.4	+0.5922	0.5684	0.0		
36 Sagittarii	5.1	+4.22	+7.4	-20 45.8	20 45.1	-10 33.4	+0.0015	0.5684	+0.0		
ξ Sagittarii	3.7	4.24	7.3	21 12.8	20 54.6	-10 24.3	+0.4894	0.5684	0.0		
171 B. Sagittarii	6.1	4.21	8.5	19 21.8	23 14.3	- 8 9.6	-1.2122	0.5686	0.1		
190 B. Sagittarii	5.4	4.23	9.0	19 25.0	15 1 29.0	- 5 59.7	-0.9174	0.5687	0.1		
π Sagittarii	3.0	4.29	8.5	21 9.2	2 5.9	- 5 24.2	+0.9604	0.5687	0.1		
195 B. Sagittarii	6.3	+4.25	+8.9	-19 55.9	2 7.9	- 5 22.1	-0.3104	0.5687	+0.1		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		s	$"$	$^{\circ}$	d	h	m	h	m	$^{\circ}$	$^{\circ}$		
Sagittarii	5.0	+4.26	+10.0	-19 5.8	15	5	31.2	-2 6.3	-0.7974	0.5689	+0.1160	-18 -90	
Sagittarii	6.4	4.28	10.3	19 23.1	7	13.8	-0 27.3	-0.2950	0.5689	0.1195	+10 -57		
Sagittarii	6.0	4.26	10.5	18 27.5	7	20.3	-0 21.0	-1.2463	0.5689	0.1197	-55 -87		
Sagittarii	6.1	4.33	11.8	19 1.9	13	37.0	+5 42.1	+0.1419	0.5690	0.1322	+35 -31		
Sagittarii	5.8	4.32	12.1	18 24.6	13	53.6	+5 58.1	-0.4640	0.5690	0.1328	+3 -69		
Sagittarii	6.0	+4.39	+13.2	-19 15.0	20	24.6	-11 44.9	+1.3077	0.5689	+0.1453	+69 +60		
Capricorni	6.2	4.38	17.1	15 2.4	16	8 47.8	+0 11.5	-1.0725	0.5685	0.1676	-32 -90		
Capricorni	3.2	4.38	17.1	15 2.2	8	53.9	+0 17.4	-1.0584	0.5685	0.1678	-30 -90		
Capricorni	6.4	4.42	17.5	16 0.5	12	13.4	+3 29.7	+0.5017	0.5684	0.1735	+61 -11		
Capricorni	6.2	4.41	17.8	15 19.6	13	14.8	+4 28.9	-0.0149	0.5683	0.1751	+30 -40		
Capricorni	6.1	+4.39	+18.5	-13 59.9	14	36.6	+5 47.8	-1.1258	0.5683	+0.1774	-35 -90		
Capricorni	5.2	4.43	18.6	15 14.3	16	47.8	+7 54.3	+0.5262	0.5682	0.1809	+64 -10		
Capricorni	6.0	4.42	20.1	12 50.6	21	46.0	-11 18.2	-0.9837	0.5680	0.1885	-22 -90		
Aquarii	4.5	4.43	21.8	11 41.9	17	5 58.5	-3 23.3	-0.5397	0.5677	0.2002	+6 -74		
Aquarii	6.5	4.42	22.3	10 56.3	8	1.2	-1 25.0	-0.8911	0.5677	0.2030	-15 -90		
Aquarii	5.6	+4.43	+23.1	-10 5.5	12	46.7	+3 10.3	-0.7595	0.5675	+0.2089	-6 -90		
Aquarii	6.5	4.47	23.1	11 55.1	14	4.2	+4 25.1	+1.3421	0.5675	0.2104	+74 +57		
Capricorni	5.3	4.46	24.6	9 27.2	21	23.1	+11 28.3	+0.4420	0.5675	0.2185	+63 -15		
Capricorni	6.3	4.46	24.6	9 38.9	21	56.1	-11 59.9	+0.7571	0.5675	0.2190	+80 +3		
Aquarii	5.6	4.45	26.0	6 54.7	18	5 20.7	-4 51.0	-0.3194	0.5676	0.2259	+20 -57		
Aquarii	6.4	+4.44	+26.7	-5 7.1	9	28.3	-0 52.2	-1.1604	0.5678	+0.2291	-31 -90		
Aquarii	5.7	4.46	26.8	5 47.4	11	22.0	+0 57.4	-0.0582	0.5679	0.2305	+35 -42		
Aquarii	5.8	4.46	27.2	5 14.7	14	24.7	+3 53.6	+0.1070	0.5681	0.2325	+44 -33		
Aquarii	6.3	4.45	27.7	3 19.4	17	32.6	+6 54.9	-1.0614	0.5683	0.2343	-23 -90		
Aquarii	5.2	4.47	27.7	4 38.6	20	20.2	+9 36.3	+0.8991	0.5686	0.2357	+85 +11		
Aquarii	6.3	+4.47	+27.9	-3 58.4	21	39.4	+10 52.8	+0.5484	0.5687	+0.2363	+73 -9		
Piscium	6.2	4.47	28.5	2 49.6	19	5 13.0	-5 49.9	+1.2134	0.5696	0.2389	+87 +35		
Piscium	6.3	4.46	28.8	0 14.8	6	14.9	-4 50.3	-1.0790	0.5698	0.2391	-24 -90		
Piscium	6.4	4.48	29.2	0 9.0	16	6.3	+4 39.8	+1.1896	0.5713	0.2399	+90 +33		
Piscium	4.9	4.48	29.2	+0 48.9	17	34.0	+6 4.4	+0.5924	0.5716	0.2397	+78 -7		
Piscium	6.4	+4.48	+29.2	+0 40.8	17	42.1	+6 12.2	+0.7568	0.5716	+0.2397	+90 +2		
Piscium	5.7	4.48	29.3	1 39.3	21	37.4	+9 59.0	+0.7394	0.5724	0.2391	+90 +2		
Piscium	5.4	4.49	29.3	3 2.4	20	1 53.5	-9 54.2	+0.4007	0.5734	0.2380	+63 -17		
Piscium	6.2	4.52	28.8	7 47.6	14	40.5	+2 24.8	-1.2458	0.5766	0.2315	-39 -82		
Piscium	5.4	4.52	28.8	7 44.6	16	22.2	+4 2.7	-0.8052	0.5771	0.2303	-5 -82		
Piscium	6.5	+4.53	+28.1	+8 54.9	21	0 59.6	-11 39.0	+0.0030	0.5796	+0.2230	+39 -36		
Piscium	6.3	4.58	26.8	12 31.5	11	28.7	-1 33.5	-1.2525	0.5828	0.2113	-41 -77		
Piscium	6.2	4.59	25.0	14 15.0	23	24.8	+9 55.3	-0.5223	0.5866	0.1945	+10 -64		
Arietis	6.4	4.62	22.2	16 50.8	22	12 56.6	-1 4.2	-0.6034	0.5904	0.1712	+5 -67		
Arietis	6.4	4.59	20.6	17 20.8	21	31.7	+7 10.9	+0.2989	0.5925	0.1543	+57 -13		
Arietis	6.5	+4.57	+19.5	+17 25.4	23	2 50.9	-11 42.3	+1.0171	0.5935	+0.1431	+90 +30		
Arietis	6.0	4.57	19.0	17 56.9	4	30.7	-10 6.5	+0.7309	0.5938	0.1395	+90 +12		
Arietis	6.0	4.56	18.4	18 0.3	7	23.2	-7 20.8	+1.0676	0.5943	0.1332	+90 +36		
Arietis	5.8	4.62	17.6	20 20.7	8	15.2	-6 30.8	-1.1467	0.5944	0.1313	-34 -70		
Arietis	6.5	4.54	17.2	18 29.2	12	19.5	-2 36.2	+1.2222	0.5949	0.1220	+90 +52		
Arietis	4.5	+4.57	+16.7	+19 25.3	13	36.2	-1 22.6	+0.4426	0.5950	+0.1191	+67 -2		
Arietis	5.0	4.59	16.0	20 44.7	14	53.0	-0 8.8	-0.7284	0.5952	0.1161	-3 -69		
Arietis	5.2	4.58	15.4	20 51.4	17	22.0	+2 14.4	-0.5586	0.5953	0.1103	+7 -58		
Arietis	5.2	4.56	15.4	20 27.2	17	58.5	+2 49.5	-0.0896	0.5954	0.1089	+33 -29		
Arietis	6.0	4.56	15.2	20 31.1	18	38.0	+3 27.4	-0.0821	0.5954	0.1073	+34 -23		
Tauri	6.5	+4.52	+13.8	+20 39.2	24	0 21.2	+8 57.0	+0.3570	0.5955	+0.0936	+61 -		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Pa- rallels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
22 H. Tauri	6.1	+4.51	+13.3	+20 40.5	24 2 30.0	+11 0.6	+0.5316	0.5955	+0.0883	+75	+6
133 B. Tauri	5.9	4.53	12.4	21 59.9	4 37.5	-10 56.9	-0.6186	0.5955	0.0831	+3	-61
32 Tauri	5.8	4.52	11.6	22 14.8	7 20.9	-8 20.0	-0.6511	0.5953	0.0764	+1	-63
161 B. Tauri	6.5	4.52	11.0	22 58.4	8 56.8	-6 47.9	-1.2671	0.5951	0.0724	-56	-67
A Tauri	4.5	4.48	11.0	21 51.7	10 25.8	-5 22.4	-0.0408	0.5950	0.0687	+36	-23
39 Tauri	6.1	+4.48	+10.9	+21 47.5	10 40.8	-5 8.0	+0.0473	0.5949	+0.0681	+41	-18
192 B. Tauri	6.1	4.46	10.0	22 12.4	13 38.4	-2 17.5	-0.1816	0.5946	0.0607	+28	-30
51 Tauri	5.6	4.42	9.8	21 23.0	15 49.6	-0 11.4	+0.7794	0.5942	0.0551	+90	-23
53 Tauri	5.3	4.40	9.8	20 56.9	16 14.9	+0 12.9	+1.2434	0.5942	0.0541	+84	+61
56 Tauri	5.2	4.41	9.6	21 34.7	16 18.6	+0 16.5	+0.6069	0.5942	0.0539	+84	+13
κ Tauri	4.1	+4.41	+8.8	+22 6.6	18 34.2	+2 26.8	+0.1849	0.5937	+0.0482	+50	-9
67 Tauri	5.4	4.41	8.8	22 1.0	18 35.5	+2 28.0	+0.2810	0.5937	0.0482	+56	-4
ν Tauri	4.2	4.43	8.6	22 37.9	18 56.1	+2 47.7	-0.3269	0.5937	0.0473	+20	-38
72 Tauri	5.4	4.42	8.4	22 48.9	19 19.5	+3 10.2	-0.4955	0.5936	0.0463	+10	-49
247 B. Tauri	5.8	4.38	8.8	21 26.4	19 37.5	+3 27.5	+0.9143	0.5935	0.0456	+90	+33
284 B. Tauri	6.0	+4.40	+7.3	+23 10.6	22 57.2	+6 39.4	-0.7124	0.5928	+0.0372	-3	-66
τ Tauri	4.3	4.36	6.9	22 48.2	25 1 14.7	+8 51.5	-0.2542	0.5922	0.0314	+24	-32
300 B. Tauri	6.2	4.37	6.4	23 28.8	2 36.6	+10 10.2	-0.9052	0.5918	0.0280	-16	-67
99 Tauri	6.0	4.34	5.0	23 49.4	7 25.5	-9 12.2	-1.1525	0.5904	0.0159	-38	-66
105 Tauri	6.0	4.21	4.8	21 35.9	11 30.3	-5 16.9	+1.1699	0.5889	+0.0057	+90	+56
108 Tauri	6.2	+4.19	+3.8	+22 11.6	14 31.6	-2 22.6	+0.5674	0.5877	-0.0017	+79	+16
η Tauri	5.1	4.17	3.4	22 0.8	16 4.0	-0 53.8	+0.7468	0.5871	0.0055	+90	+26
θ Tauri	4.8	4.12	2.7	21 52.1	19 27.1	+2 21.5	+0.8651	0.5857	0.0138	+90	+32
175 H. Tauri	6.5	4.07	1.1	22 37.3	26 1 19.3	+8 0.2	-0.0324	0.5829	0.0278	+37	-19
394 B. Tauri	6.0	4.08	+0.7	23 10.0	1 49.8	+8 29.6	-0.6113	0.5826	0.0290	+4	-56
141 Tauri	6.3	+3.96	-0.8	+22 24.0	9 25.3	-8 12.1	-0.1053	0.5787	-0.0466	+33	-25
1 Geminorum	4.3	3.97	1.4	23 16.1	10 25.1	-7 14.5	-1.0568	0.5782	0.0489	-27	-67
14 B. Geminorum	6.0	3.91	1.5	22 12.2	12 41.8	-5 2.9	-0.0663	0.5769	0.0540	+35	-23
3 Geminorum	5.6	3.94	1.8	23 7.7	12 45.8	-4 59.0	-1.0325	0.5768	0.0542	-25	-67
6 Geminorum	6.3	3.92	2.0	22 55.7	13 50.9	-3 56.3	-0.8848	0.5762	0.0566	-14	-67
η Gemin. (var.)	3.2	+3.89	-2.1	+22 31.9	14 55.9	-2 53.7	-0.5344	0.5755	-0.0590	+8	-53
μ Geminorum	3.2	3.85	2.9	22 33.4	18 20.1	+0 22.9	-0.7752	0.5736	0.0664	-6	-67
15 Geminorum	6.5	3.77	2.7	20 50.4	20 24.5	+2 22.8	+0.8780	0.5723	0.0709	+90	+28
16 Geminorum	6.2	3.76	2.6	20 32.7	20 29.0	+2 27.2	+1.1806	0.5723	0.0710	+90	+51
d Geminorum	5.2	3.66	5.2	21 51.4	27 6 36.8	-11 46.9	-1.0222	0.5658	0.0918	-24	-68
ζ Gemin. (var.)	3.7	+3.55	-5.8	+20 41.4	12 7.8	-6 27.6	-0.3287	0.5622	-0.1024	+20	-43
56 Geminorum	5.2	3.44	7.3	20 35.8	20 4.2	+1 12.2	-1.1052	0.5570	0.1169	-30	-69
61 Geminorum	5.8	3.41	7.6	20 25.2	22 19.2	+3 22.6	-1.1855	0.5555	0.1208	-39	-70
f Geminorum	5.3	3.27	7.7	17 51.6	28 4 3.7	+8 55.4	+0.8172	0.5517	0.1303	+90	+17
g Geminorum	5.0	3.25	8.5	18 42.5	7 6.6	+11 52.2	-0.4923	0.5497	0.1351	+11	-57
2 B. Cancr	6.0	+3.14	-8.7	+16 44.3	12 54.0	-6 32.1	+0.8068	0.5459	-0.1439	+90	+15
3 Cancr	5.7	3.15	9.2	17 31.9	13 57.0	-5 31.0	-0.1949	0.5453	0.1455	+28	-40
5 Cancr	5.9	3.12	8.9	16 40.8	14 17.8	-5 11.0	+0.6671	0.5450	0.1460	+89	+7
29 Cancr	5.9	2.93	10.1	14 28.8	29 3 15.8	+7 21.9	+1.0291	0.5370	0.1632	+90	-28
90 B. Cancr	6.3	2.91	10.9	15 35.7	6 53.9	+10 53.1	-0.7747	0.5349	0.1676	-5	-74
α Cancr	4.3	+2.74	-11.2	+12 10.4	17 59.5	-2 21.9	+1.0030	0.5288	-0.1795	+90	+23
209 B. Cancr	6.5	2.68	11.7	11 53.7	23 40.6	+3 8.8	+0.2695	0.5259	0.1848	+54	-20
222 B. Cancr	6.3	2.64	12.1	11 50.5	30 3 47.0	+7 7.8	-0.4383	0.5239	0.1884	+15	-61
ω Leonis	5.5	2.56	11.9	9 24.7	9 14.0	-11 34.9	+1.1731	0.5215	0.1927	+90	+35
h Leonis	5.2	2.55	12.3	10 4.5	11 2.2	-9 49.9	+0.1009	0.5207	0.1940	+44	-30
σ Leonis	3.8	+2.50	-12.7	+10 15.8	15 48.4	-5 12.1	-1.0385	0.5187	-0.1973	-21	-80

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
		$\Delta\alpha$	$\Delta\delta$								
		<i>s</i>	<i>"</i>	<i>"</i>	<i>d h m</i>	<i>h m</i>				<i>"</i>	<i>"</i>
B. Leonis	6.2	+2.43	-13.0	+ 8 42.1	1 0 42.6	+ 3 26.6	-1.1138	0.5157	-0.2025	-27	-81
Leonis	4.9	2.41	13.0	8 26.1	1 49.0	+ 4 31.0	-1.0447	0.5152	0.2031	-21	-82
Sextantis	6.3	2.37	12.7	6 0 5	5 19.1	+ 7 55.1	+0.9034	0.5140	0.2048	+90	+13
Sextantis	5.9	2.34	12.7	5 1 0	8 31.5	+11 1.9	+1.3349	0.5131	0.2062	+83	+53
B. Leonis	6.5	2.30	13.4	6 6.4	14 6.1	- 7 33.0	-1.0192	0.5117	0.2082	-19	-84
B. Leonis	6.3	+2.20	-13.2	+ 1 27.4	2 5 45.3	+ 7 39.7	+0.8168	0.5088	-0.2118	+90	+ 6
Leonis	6.1	2.20	13.2	1 10.2	7 38.4	+ 9 29.8	+0.7334	0.5085	0.2120	+90	+ 1
Leonis	6.1	2.17	13.2	+ 0 26.2	11 56.8	-10 19.0	+0.6309	0.5081	0.2123	+81	- 5
NEW MOON.											
H. Virginis	5.1	+2.33	-11.6	-15 55.1	6 15 38.5	- 9 28.0	-0.3760	0.5272	-0.1507	+10	-62
Librae	4.7	2.60	9.6	19 29.1	7 21 52.3	- 4 10.4	-0.3343	0.5391	0.1065	+ 8	-59
Librae	6.0	2.60	9.5	19 20.5	22 24.2	- 3 39.5	-0.5487	0.5394	0.1056	- 4	-76
B. Librae	6.2	2.70	8.8	20 27.0	8 6 39.3	+ 4 19.7	-0.1385	0.5425	0.0916	+16	-47
B. Librae	6.1	2.69	8.6	19 53.2	7 11.8	+ 4 51.2	-0.8083	0.5427	0.0907	-21	-90
B. Librae	5.9	+2.74	- 8.4	-20 44.9	10 17.0	+ 7 50.3	-0.1300	0.5438	-0.0852	+16	-46
G. Scorpui	5.9	2.83	7.2	20 44.9	19 24.5	- 7 20.0	-0.8310	0.5470	0.0686	-25	-90
Scorpui	2.5	2.87	7.5	22 23.5	20 37.4	- 6 9.5	+0.8946	0.5475	0.0664	+68	+15
Scorpui	4.6	2.88	6.6	20 39.0	23 56.3	- 2 57.2	-1.2291	0.5485	0.0601	-58	-87
B. Scorpui	6.3	2.91	6.1	20 54.1	9 3 13.0	+ 0 13.0	-1.1383	0.5496	0.0538	-49	-90
G. Scorpui	6.5	+2.93	- 6.0	-21 6.1	4 22.1	+ 1 19.8	-0.9783	0.5500	-0.0516	-36	-90
MARS	1.3	...	...	22 23.2	5 53.8	+ 2 48.5	+0.3543	0.5190	0.0427	+40	-18
Ophiuchi	4.7	3.02	6.0	23 15.6	8 18.0	+ 5 7.9	+1.2001	0.5511	0.0439	+67	+44
Ophiuchi	4.5	3.01	5.0	21 17.6	11 20.3	+ 8 4.1	-1.0790	0.5520	0.0379	-45	-90
Ophiuchi	5.5	3.18	3.7	23 1.3	22 33.1	- 5 5.9	+0.5123	0.5549	0.0153	+47	- 9
B. Ophiuchi	6.3	+3.19	- 2.6	-21 27.2	10 2 49.7	- 0 58.1	-1.2438	0.5558	-0.0065	-65	-82
Ophiuchi	6.4	3.35	- 0.3	21 59.4	15 54.6	+11 39.9	-0.5636	0.5581	+0.0207	-14	-79
Ophiuchi	4.8	3.38	+ 0.4	21 38.7	19 33.2	- 8 49.1	-0.8464	0.5586	0.0283	-30	-90
G. Sagittarii	5.7	3.51	1.6	22 46.7	11 3 46.5	- 0 52.8	+0.6811	0.5594	0.0455	+64	+ 1
G. Sagittarii	6.2	3.50	2.6	21 27.2	6 9.0	+ 1 24.8	-0.6316	0.5596	0.0505	-15	-87
Sagittarii	4.0	+3.53	+ 3.2	-21 4.8	9 4.9	+ 4 14.6	-0.8732	0.5598	+0.0566	-29	-90
Sagittarii	5.6	3.54	3.0	21 44.1	9 17.7	+ 4 26.9	-0.1584	0.5598	0.0570	+12	-48
Sagittarii	5.3	3.52	3.5	20 45.2	9 43.9	+ 4 52.2	-1.1875	0.5598	0.0579	-54	-90
Sagittarii	5.0	3.57	4.4	20 35.1	14 14.5	+ 9 13.4	-1.0818	0.5600	0.0672	-43	-90
B. Sagittarii	5.7	3.65	5.2	21 27.9	19 48.4	- 9 24.3	+0.2662	0.5602	0.0786	+37	-23
B. Sagittarii	5.9	+3.65	+ 5.4	-21 7.1	20 15.1	- 8 58.6	-0.0681	0.5602	+0.0796	+19	-42
B. Sagittarii	6.3	3.68	6.0	21 5.1	23 6.0	- 6 13.6	+0.1295	0.5602	0.0853	-30	-81
Sagittarii	5.3	3.69	6.7	20 25.0	12 1 2.8	- 4 20.9	-0.4106	0.5602	0.0893	+ 1	-65
Sagittarii	5.8	3.74	6.6	21 27.6	2 57.3	- 2 30.4	+0.8713	0.5602	0.0930	+69	+13
Sagittarii	5.1	3.73	7.2	20 45.8	4 27.0	- 1 3.8	+0.2720	0.5602	0.0960	+39	-23
Sagittarii	3.7	+3.75	+ 7.0	-21 12.8	4 36.8	- 0 54.3	+0.7666	0.5602	+0.0964	+69	+ 5
B. Sagittarii	6.1	3.72	8.2	19 21.8	7 0.8	+ 1 24.6	-0.9598	0.5602	0.1011	-30	-90
B. Sagittarii	6.4	3.72	8.3	19 13.2	7 2.4	+ 1 26.2	-1.1088	0.5602	0.1011	-42	-90
B. Sagittarii	5.4	3.75	8.6	19 25.0	9 19.8	+ 3 38.8	-0.6618	0.5601	0.1057	-11	-89
Sagittarii	3.0	3.80	8.1	21 9.2	9 57.8	+ 4 15.4	+1.2426	0.5601	0.1069	+69	+48
B. Sagittarii	6.3	+3.77	+ 8.5	-19 55.9	9 59.9	+ 4 17.5	-0.0464	0.5601	+0.1069	+22	-41
Sagittarii	5.0	3.78	9.6	19 5.8	13 29.6	+ 7 39.9	-0.5421	0.5600	0.1137	- 3	-76
B. Sagittarii	6.4	3.81	9.8	19 23.2	15 15.6	+ 9 22.2	-0.0333	0.5600	0.1170	+24	-40
Sagittarii	6.0	3.79	10.1	18 27.5	15 22.3	+ 9 28.7	-0.9987	0.5600	0.1173	-31	-90
B. Sagittarii	6.1	3.87	11.2	19 1.9	21 51.4	- 8 15.7	+0.4062	0.5597	0.1294	+51	-16
B. Sagittarii	5.8	+3.86	+11.5	-18 24.7	22 8.6	- 7 59.2	-0.2090	0.5596	+0.1299	+16	-51

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S						AT CONJUNCTION IN R. A.						Limiting Par- allels.
Name.	Mag.	Red'ns from 1918.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y'	z'	y'	N. S.		
		$\Delta\alpha$	$\Delta\delta$									
		s	"	"	d	h	m	h	m			"
16 B. Capricorni	6.2	+3.96	+16.4	-15 2.4	13 17 41.5	+10	53.1	-0.8438	0.5587	+0.1636	-16-30	
β Capricorni	3.2	3.97	16.4	15 2.2	17 47.8	+10	59.1	-0.8296	0.5586	0.1638	-15-36	
31 B. Capricorni	6.4	4.02	16.7	16 0.5	21 14.2	-	941.6	+0.7505	0.5585	0.1692	+74+3	
27 G. Capricorni	6.2	4.01	17.0	15 19.6	22 17.7	-	840.2	+0.2247	0.5584	0.1709	+44-26	
45 B. Capricorni	6.1	4.00	17.8	13 59.9	23 42.3	-	718.6	-0.9048	0.5584	0.1730	-19-30	
r Capricorni	5.2	+4.04	+17.7	-15 14.3	14 1 58.0	-	5 7.6	+0.7696	0.5583	+0.1764	+75+4	
84 B. Capricorni	6.0	4.05	19.4	12 50.6	7 6.3	-	0 9.8	-0.7699	0.5582	0.1839	- 9-30	
r Aquarii	4.5	4.10	21.1	11 41.9	15 35.2	+	8 1.5	-0.3314	0.5582	0.1953	+17-38	
51 G. Aquarii	6.5	4.09	21.6	10 56.3	17 41.9	+10	3.8	-0.6912	0.5582	0.1979	- 3-30	
17 Aquarii	6.3	4.10	22.6	9 39.8	21 35.6	-10	10.6	-1.2091	0.5583	0.2026	-39-30	
19 Aquarii	5.6	+4.12	+22.5	-10 5.5	22 36.5	-	9 11.8	-0.5656	0.5583	+0.2038	+ 5-36	
ξ Aquarii	4.8	4.15	23.9	8 13.0	15 4 14.2	-	345.8	-1.3026	0.5586	0.2100	-50-57	
c^1 Capricorni	5.3	4.19	24.0	9 27.2	7 28.6	-	038.1	+0.6362	0.5588	0.2133	+77-4	
c^2 Capricorni	6.3	4.20	24.0	9 38.9	8 2.6	-	0 5.3	+0.9543	0.5589	0.2138	+80+15	
30 Aquarii	5.6	4.22	25.6	6 54.7	15 39.8	+	716.2	-0.1513	0.5597	0.2206	+29-47	
138 B. Aquarii	6.4	+4.22	+26.5	- 5 7.1	19 53.8	+11	21.4	-1.0109	0.5602	+0.2240	-20-30	
44 Aquarii	5.7	4.25	26.6	5 47.4	21 50.4	-10	46.1	+0.0999	0.5605	0.2254	+43-33	
51 Aquarii	5.8	4.27	27.0	5 14.7	10 57.6	-	745.3	+0.2600	0.5611	0.2274	+53-24	
187 B. Aquarii	6.3	4.27	27.7	3 19.4	4 9.9	-	439.7	-0.9279	0.5616	0.2293	-14-30	
κ Aquarii	5.2	4.31	27.5	4 38.6	7 1.1	-	154.6	+1.0458	0.5622	0.2308	+85-21	
207 B. Aquarii	6.3	+4.31	+27.8	- 3 58.4	8 22.0	-	036.4	+0.6883	0.5625	+0.2314	+85-1	
6 G. Piscium	6.2	4.36	28.5	2 49.6	16 4.3	+	649.6	+1.3392	0.5644	0.2342	+82+52	
3 Piscium	6.3	4.36	29.2	0 14.8	17 7.3	+	750.4	-0.9747	0.5646	0.2345	-16-30	
22 B. Piscium	6.4	4.43	29.6	- 0 9.0	3 7.6	-	630.6	+1.2844	0.5677	0.2358	+90+44	
κ Piscium	4.9	4.44	29.7	+ 0 48.9	4 36.3	-	5 5.0	+0.6794	0.5682	0.2357	+87-2	
9 Piscium	6.4	+4.44	+29.7	+ 0 40.8	4 44.5	-	457.1	+0.8445	0.5682	+0.2357	+90+8	
16 Piscium	5.7	4.46	30.0	1 39.3	8 42.4	-	1 7.8	+0.8158	0.5696	0.2353	+90+6	
19 Piscium	5.4	4.50	30.2	3 2.4	13 0.8	+	3 1.3	+0.4636	0.5712	0.2344	+67-13	
36 Piscium	6.2	4.61	30.5	7 47.6	18 1.1	-	836.2	-1.2207	0.5765	0.2288	-37-31	
d Piscium	5.4	4.62	30.4	7 44.6	3 33.0	-	658.2	-0.7838	0.5773	0.2277	- 4-31	
136 B. Piscium	6.5	+4.68	+29.8	+ 8 55.0	12 9.4	+	119.1	+0.0018	0.5812	+0.2209	+39-36	
75 Piscium	6.3	4.80	29.0	12 31.5	22 34.3	+11	20.4	-1.2768	0.5862	0.2099	-45-77	
101 Piscium	6.2	4.90	27.3	14 15.0	19 10.2	-	119.3	-0.5780	0.5918	0.1936	+ 7-68	
20 H ¹ . Arietis	6.4	5.02	24.6	16 50.8	23 39.4	+11	26.9	-0.6887	0.5976	0.1709	0-72	
27 Arietis	6.4	5.05	22.9	17 20.9	20 8 3.2	-	429.4	+0.1862	0.6007	0.1542	+49-19	
36 Arietis	6.5	+5.06	+21.7	+17 25.4	13 14.6	+	029.5	+0.8849	0.6024	+0.1431	+90+21	
40 Arietis	6.0	5.08	21.3	17 56.9	14 51.8	+	2 2.7	+0.5984	0.6028	0.1395	+81+5	
45 Arietis	6.0	5.08	20.6	18 0.4	17 39.8	+	444.0	+0.9250	0.6036	0.1332	+90+25	
ρ Arietis	5.6	5.09	20.4	17 42.2	17 53.9	+	457.4	+1.2544	0.6036	0.1327	+86+56	
47 Arietis	5.8	5.16	20.1	20 20.8	18 30.5	+	532.5	-1.2642	0.6038	0.1313	-51-70	
54 Arietis	6.5	+5.10	+19.3	+18 29.2	22 28.1	+	920.5	+1.0675	0.6047	+0.1220	+90+37	
δ Arietis	4.5	5.13	18.8	19 25.4	23 42.6	+10	32.0	+0.2953	0.6049	0.1191	+57-10	
ζ Arietis	5.0	5.16	18.3	20 44.8	10 57.3	+11	43.7	-0.8628	0.6051	0.1161	-12-09	
r Arietis	5.2	5.17	17.6	20 51.4	3 22.1	-	957.4	-0.6996	0.6055	0.1103	- 1-68	
63 Arietis	5.2	5.15	17.5	20 27.3	3 57.4	-	923.6	-0.2379	0.6056	0.1088	+25-38	
65 Arietis	6.0	+5.16	+17.3	+20 31.1	4 35.8	-	846.7	-0.2316	0.6057	+0.1073	+25-37	
14 H ¹ . Tauri	6.5	5.15	15.7	20 39.2	10 8.7	-	327.4	+0.1914	0.6062	0.0935	+50-14	
22 H ¹ . Tauri	6.1	5.15	15.0	20 40.5	12 13.6	-	127.7	+0.3599	0.6063	0.0882	+61-3	
133 B. Tauri	5.9	5.19	14.3	22 0.0	14 17.1	+	030.7	-0.7772	0.6063	0.0829	- 7-68	
32 Tauri	5.8	5.20	13.3	22 14.8	16 55.5	+	3 2.7	-0.8133	0.6063	0.0761	- 9-68	
Δ Tauri	4.5	+5.17	+12.6	+21 51.7	19 54.5	+	554.4	-0.2169	0.6061	+0.0684	+26-33	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y''	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	"	d h m	h m				"	"
B. Tauri	6.1	+5.17	+12.5	+21 47.5	21 20 9.0	+ 6 8.2	-0.1304	0.6061	+0.0678	+31	-28
B. Tauri	6.1	5.17	11.6	22 12.4	23 0.8	+ 8 53.1	-0.3603	0.6058	0.0603	+18	-41
Tauri	5.6	5.13	11.2	21 23.0	22 1 7.8	+10 54.8	+0.5829	0.6055	0.0547	+81	+12
Tauri	5.3	5.11	11.1	20 56.9	1 32.3	+11 18.3	+1.0391	0.6055	0.0537	+90	+41
Tauri	5.2	5.14	11.0	21 34.8	1 35.9	+11 21.8	+0.4123	0.6054	0.0535	+65	+ 3
B. Tauri	5.9	+5.10	+10.6	+20 47.7	3 6.4	-11 11.4	+1.2740	0.6052	+0.0495	+73	+68
Tauri	4.1	5.14	10.2	22 6.6	3 47.2	-10 32.4	-0.0065	0.6050	0.0477	+38	-19
Tauri	5.4	5.14	10.2	22 1.0	3 48.4	-10 31.2	+0.0881	0.6050	0.0477	+44	-14
Tauri	4.2	5.16	9.9	22 37.9	4 8.3	-10 12.1	-0.5108	0.6050	0.0468	+ 9	-50
Tauri	5.4	5.16	9.8	22 48.9	4 30.9	- 9 50.5	-0.6773	0.6049	0.0458	- 1	-63
B. Tauri	5.8	+5.12	+10.0	+21 26.4	4 48.3	- 9 33.7	+0.7102	0.6048	+0.0450	+90	+20
B. Tauri	6.0	5.16	8.6	23 10.6	8 1.5	- 6 28.4	-0.8956	0.6041	0.0366	-15	-67
Tauri	4.3	5.12	8.0	22 48.2	10 14.5	- 4 20.8	-0.4475	0.6035	0.0308	+13	-44
B. Tauri	6.2	5.14	7.5	23 28.8	11 33.7	- 3 4.8	-1.0899	0.6031	0.0273	-31	-67
Tauri	4.7	5.02	5.9	21 28.5	18 17.5	+ 3 22.6	+1.0512	0.6008	0.0096	+90	+46
Tauri	6.0	+5.00	+ 5.3	+21 35.9	20 9.8	+ 5 10.4	+0.9416	0.6000	+0.0048	+90	+38
Tauri	6.2	5.00	4.2	22 11.6	23 5.2	+ 7 58.8	+0.3453	0.5988	-0.0028	+60	+ 3
Tauri	5.1	4.98	3.8	22 0.8	23 0 34.7	+ 9 24.8	+0.5202	0.5981	0.0066	+74	+13
Tauri	4.8	4.94	2.9	21 52.1	3 51.2	-11 26.6	+0.6332	0.5964	0.0149	+87	+18
H ¹ . Tauri	6.5	4.90	1.0	22 37.3	9 32.1	- 5 59.1	-0.2557	0.5934	0.0291	+24	-32
B. Tauri	6.0	+4.92	+ 0.7	+23 10.0	10 1.6	- 5 30.8	-0.8260	0.5931	-0.0303	-10	-67
Tauri	6.3	4.81	- 1.3	22 24.0	17 23.0	+ 1 33.5	-0.3344	0.5886	0.0480	-19	-38
Geminorum	4.3	4.83	1.9	23 16.1	18 21.0	+ 2 29.2	-1.2721	0.5880	0.0503	-61	-67
B. Geminorum	6.0	4.77	2.2	22 12.2	20 33.6	+ 4 36.7	-0.2985	0.5866	0.0555	-21	-37
Geminorum	5.6	4.80	2.5	23 7.6	20 37.4	+ 4 40.4	-1.2500	0.5865	0.0556	-53	-67
Geminorum	6.3	+4.78	- 2.7	+22 55.6	21 40.6	+ 5 41.2	-1.1055	0.5858	-0.0581	-32	-67
Gemin. (var.)	3.2	4.75	2.8	22 31.9	22 43.7	+ 6 41.8	-0.7612	0.5851	0.0605	- 6	-67
Geminorum	3.2	4.71	3.9	22 33.3	24 2 1.9	+ 9 52.4	-1.0008	0.5828	0.0679	-23	-67
Geminorum	6.5	4.62	3.8	20 50.4	4 2.7	+11 48.7	+0.6265	0.5813	0.0724	+85	+13
Geminorum	6.2	4.61	3.7	20 32.7	4 7.1	+11 53.0	+0.9247	0.5813	0.0725	+90	+31
Geminorum	4.1	+4.60	- 3.7	+20 15.8	4 32.5	-11 42.7	+1.1844	0.5810	-0.0735	+90	+52
Geminorum	5.2	4.53	6.7	21 51.4	13 58.2	- 2 37.9	-1.2519	0.5740	0.0933	-51	-68
Gemin. (var.)	3.7	4.42	7.6	20 41.4	19 20.7	+ 2 32.9	-0.5704	0.5698	0.1038	+ 6	-59
Geminorum	5.3	4.12	10.1	17 51.6	25 10 54.8	- 6 25.9	+0.5580	0.5576	0.1315	+77	+ 2
Geminorum	5.0	4.10	11.1	18 42.5	13 54.0	- 3 32.8	-0.7366	0.5552	0.1362	- 3	-71
B. Cancri	6.0	+3.97	-11.4	+16 44.2	19 34.8	+ 1 56.4	+0.5484	0.5508	-0.1448	+76	0
Cancri	5.7	3.97	11.9	17 31.9	20 36.7	+ 2 56.2	-0.4425	0.5500	0.1463	+14	-55
Cancri	5.9	3.95	11.7	16 40.8	20 57.2	+ 3 16.0	+0.4105	0.5498	0.1468	+64	- 7
Cancri	5.9	3.72	13.1	14 28.8	26 9 42.8	- 8 23.5	+0.7733	0.5404	0.1636	+90	+11
B. Cancri	6.3	3.70	14.1	15 35.6	13 17.9	- 4 55.3	-1.0135	0.5380	0.1678	-20	-74
Cancri	5.5	+3.60	-13.7	+12 58.3	16 45.5	+ 1 34.2	+1.2096	0.5356	-0.1716	+90	+42
Cancri	5.7	3.51	14.2	11 56.2	23 0.2	+ 4 28.7	+1.2348	0.5316	0.1780	+90	+44
Cancri	4.3	3.50	14.5	12 10.3	27 0 15.9	+ 5 41.9	+0.7564	0.5308	0.1792	+90	+ 8
Cancri	5.1	3.42	14.6	10 59.7	4 53.4	+10 10.9	+1.1889	0.5279	0.1835	+90	+38
B. Cancri	6.5	3.42	15.1	11 53.7	5 53.9	+11 9.6	+0.0321	0.5274	0.1844	+40	-33
B. Cancri	6.3	+3.37	-15.6	+11 50.5	9 58.3	- 8 53.5	-0.6683	0.5251	-0.1878	+ 2	-77
Leonis	5.5	3.28	15.3	9 24.6	15 23.2	- 3 38.3	-0.9388	0.5222	0.1918	+90	+17
Leonis	5.2	3.26	15.7	10 4.4	17 10.6	- 1 54.0	-0.1260	0.5214	0.1931	+81	-42
Leonis	3.8	3.20	16.2	10 15.7	21 55.4	+ 2 42.3	-1.2554	0.5191	0.1962	-41	-80
B. Leonis	6.2	3.10	16.5	8 42.1	28 6 47.6	+11 19.0	-1.3215	0.5154	0.2011	-51	-81
Leonis	4.9	+3.08	-16.5	+ 8 26.0	7 53.8	-11 36.7	-1.2515	0.5149	-0.2016	-40	-82

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallax	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	γ'	α'	γ''	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	"	d h m	h m				"	"
14 Sextantis	6.3	+3.02	-16.0	+ 6 0.5	28 11 23.4	- 8 13.2	+0.6940	0.5137	-0.2032	+89	0
19 Sextantis	5.9	2.98	15.9	5 1.0	14 35.4	- 5 6.7	+1.1286	0.5126	0.2045	+90	+29
155 B. Leonis	6.5	2.92	16.7	6 6.4	20 9.6	+ 0 18.0	-1.2114	0.5109	0.2064	-36	-84
237 B. Leonis	6.3	2.77	16.1	1 27.3	29 11 48.9	- 8 29.3	+0.6440	0.5076	0.2096	+83	-4
55 Leonis	6.1	2.76	16.1	1 10.2	13 42.1	- 6 39.1	+0.5639	0.5073	0.2098	+75	-8
p^3 Leonis	6.1	+2.71	-16.0	+ 0 26.2	18 0.8	- 2 27.7	+0.4688	0.5068	-0.2100	+67	-13
p^5 Leonis	5.3	2.67	16.2	+ 0 22.3	23 32.8	+ 2 55.2	-0.6228	0.5064	0.2100	+ 5	-31
388 B. Leonis	6.3	2.62	15.9	- 1 15.2	30 7 16.5	+10 26.0	-0.4455	0.5062	0.2093	+14	-66
e Leonis	5.1	2.61	15.6	2 33.3	8 35.9	+11 43.1	+0.7203	0.5062	0.2091	+87	0
431 B. Leonis	6.2	2.58	15.8	1 59.2	13 1.2	- 7 59.1	-0.8321	0.5064	0.2083	- 8	-90
13 B. Virginis	5.9	+2.54	-15.3	- 4 52.9	19 55.4	- 1 16.3	+0.9463	0.5069	-0.2065	+85	+14
78 B. Virginis	6.5	2.48	15.1	5 16.0	31 8 33.7	+11 0.9	-1.2078	0.5087	0.2018	-36	-90
q Virginis	5.3	2.45	14.4	9 0.2	19 6.0	- 2 44.6	+0.8468	0.5109	0.1963	+81	+8
χ Virginis	4.8	+2.44	-14.6	- 7 32.9	22 2.4	+ 0 6.8	-1.3458	0.5117	-0.1945	-59	-78

NOVEMBER.

370 B. Virginis	6.0	+2.43	-13.8	-11 12.5	1 6 4.7	+ 7 55.5	+1.1824	0.5140	-0.1890	+79	+34
ψ Virginis	5.0	2.42	14.1	9 5.9	6 6.1	+ 7 56.9	-1.1691	0.5140	0.1890	-35	-90
NEW MOON.											
51 G. Scorpii	6.5	+2.76	- 5.0	-21 6.1	5 10 4.0	+ 8 49.1	-0.8586	0.5527	-0.0505	-28	-90
ω Ophiuchi	4.5	2.81	4.0	21 17.6	17 0.7	- 8 28.2	-0.9512	0.5546	0.0368	-36	-90
24 Ophiuchi	5.5	2.92	2.6	23 1.3	6 4 12.0	+ 2 20.5	+0.6544	0.5569	0.0142	+59	-1
116 B. Ophiuchi	6.3	2.91	1.7	21 27.1	8 28.5	+ 6 28.2	-1.1004	0.5576	-0.0055	-50	-90
190 B. Ophiuchi	5.9	+2.98	- 0.3	-21 22.0	16 48.9	- 9 28.5	-1.1648	0.5586	+0.0118	-55	-90
52 Ophiuchi	6.4	3.03	+ 0.4	21 59.4	21 34.2	- 4 53.1	-0.4068	0.5590	0.0217	- 5	-65
58 Ophiuchi	4.8	3.05	1.1	21 38.6	7 1 13.5	- 1 21.4	-0.6877	0.5592	0.0292	-20	-90
21 G. Sagittarii	5.7	3.14	2.3	22 46.7	9 29.1	+ 6 37.2	+0.8530	0.5593	0.0463	+67	+12
30 G. Sagittarii	6.2	3.13	3.0	21 27.1	11 52.5	+ 8 55.6	-0.4643	0.5593	0.0512	- 6	-69
μ Sagittarii	4.0	+3.15	+ 3.7	-21 4.8	14 49.7	+11 46.7	-0.7052	0.5592	+0.0572	-18	-90
14 Sagittarii	5.6	3.15	3.5	21 44.1	15 2.6	+11 59.2	+0.0137	0.5592	0.0577	+21	-38
15 Sagittarii	5.3	3.15	3.9	20 45.1	15 29.0	-11 35.4	-1.0207	0.5592	0.0586	-39	-90
21 Sagittarii	5.0	3.18	4.7	20 35.1	20 1.9	- 7 11.8	-0.9120	0.5590	0.0678	-30	-90
115 B. Sagittarii	5.7	3.25	5.4	21 27.9	8 1 39.2	- 1 46.2	+0.4479	0.5585	0.0790	+49	-13
121 B. Sagittarii	5.9	+3.24	+ 5.5	-21 7.1	2 6.2	- 1 20.2	+0.1116	0.5585	+0.0799	+28	-32
128 B. Sagittarii	6.3	3.27	6.1	21 5.1	4 59.1	+ 1 26.8	-0.3123	0.5582	0.0856	+41	-20
29 Sagittarii	5.3	3.27	6.7	20 25.0	6 57.4	+ 3 21.0	-0.2308	0.5579	0.0894	+11	-52
33 Sagittarii	5.8	3.31	6.7	21 27.6	8 53.3	+ 5 13.0	+1.0621	0.5577	0.0931	+69	+27
36 Sagittarii	5.1	3.31	7.2	20 45.8	10 24.2	+ 6 40.9	+0.4589	0.5576	0.0960	+51	-13
ϵ Sagittarii	3.7	+3.32	+ 7.1	-21 12.8	10 34.2	+ 6 50.5	+0.9575	0.5575	+0.0963	+69	+19
171 B. Sagittarii	6.1	3.30	8.1	19 21.8	13 0.3	+ 9 11.5	-0.7819	0.5572	0.1010	-19	-90
173 B. Sagittarii	6.4	3.30	8.1	19 13.2	13 1.9	+ 9 13.0	-0.9324	0.5572	0.1010	-28	-90
187 B. Sagittarii	6.4	3.30	8.5	18 51.8	14 51.1	+10 58.5	-1.1257	0.5570	0.1045	-43	-90
190 B. Sagittarii	5.4	3.32	8.5	19 25.0	15 21.4	+11 27.8	-0.4806	0.5569	0.1054	- 1	-70
195 B. Sagittarii	6.3	+3.34	+ 8.4	-19 55.9	16 2.2	-11 52.8	+0.1404	0.5568	+0.1067	+33	-30
d Sagittarii	5.0	3.35	9.3	19 5.8	19 35.3	- 8 27.0	-0.3585	0.5563	0.1133	+ 6	-61
226 B. Sagittarii	6.4	3.37	9.6	19 23.2	21 23.2	- 6 42.8	+0.1558	0.5561	0.1166	+35	-29
45 Sagittarii	6.0	3.36	9.8	18 27.5	21 30.0	- 6 36.2	-0.8189	0.5560	0.1168	-19	-90
266 B. Sagittarii	6.1	3.42	10.8	19 1.9	9 4 6.5	+ 0 13.1	+0.6019	0.5550	0.1285	+64	-5
267 B. Sagittarii	5.8	+3.41	+11.0	-18 24.7	4 24.0	+ 0 3.7	-0.0197	0.5550	+0.1290	+26	-39

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.			Hour Angle, <i>H</i>	<i>P</i>	<i>z'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d	h	m							h	m
16 B. Capricorni	6.2	+3.52	+15.5	-15 2.4	10	0	24.7	-4 36.1	-0.6613	0.5518	+0.1615	-5	-87
β Capricorni	3.2	3.53	15.5	15 2.2		0	31.1	-4 30.0	-0.6470	0.5518	0.1617	-4	-85
31 B. Capricorni	6.4	3.58	15.7	16 0.6		4	3.2	-1 5.0	+0.9543	0.5512	0.1669	+74	+17
27 G. Capricorni	6.2	3.57	16.0	15 19.6		5	8.5	0 1.9	+0.4212	0.5511	0.1685	+56	-15
45 B. Capricorni	6.1	3.56	16.8	14 0.0		6	35.5	+1 22.2	-0.7244	0.5509	0.1705	-7	-90
τ Capricorni	5.2	+3.61	+16.7	-15 14.3		8	55.2	+3 37.3	+0.9735	0.5506	+0.1738	+75	+18
84 B. Capricorni	6.0	3.62	18.3	12 50.6		14	12.9	+8 44.3	-0.5897	0.5500	0.1809	+2	-78
γ Aquarii	4.5	3.68	19.9	11 41.9		22	58.1	-6 48.0	-0.1480	0.5492	0.1917	+26	-47
51 G. Aquarii	6.5	3.68	20.4	10 56.4		11	1 8.9	-4 41.5	-0.5146	0.5491	0.1942	+7	-72
17 Aquarii	6.3	3.70	21.5	9 39.8		5	10.6	-0 47.9	-1.0430	0.5488	0.1986	-25	-90
19 Aquarii	5.6	+3.72	+21.2	-10 5.5		6	13.7	+0 13.1	-0.3897	0.5488	+0.1998	+14	-62
ϵ Aquarii	4.8	3.76	22.7	8 13.0		12	3.2	+5 51.0	-1.1427	0.5487	0.2056	-32	-90
ϵ^1 Capricorni	5.3	3.80	22.7	9 27.2		15	24.6	+9 5.7	+0.8266	0.5488	0.2087	+81	+7
ϵ^2 Capricorni	6.3	3.80	22.7	9 38.9		15	59.8	+9 39.7	+1.1497	0.5488	0.2093	+80	+30
30 Aquarii	5.6	3.85	24.4	6 54.7		23	53.8	-6 42.0	+0.0191	0.5492	0.2157	+38	-37
138 B. Aquarii	6.4	+3.87	+25.4	-5 7.1	13	4	17.3	-2 27.3	-0.8594	0.5496	+0.2188	-10	-90
44 Aquarii	5.7	3.90	25.4	5 47.4		6	18.3	+0 30.4	+0.2689	0.5498	0.2202	+53	-24
51 Aquarii	5.8	3.93	25.8	5 14.7		9	32.4	+2 37.3	+0.4286	0.5504	0.2221	+64	-15
187 B. Aquarii	6.3	3.95	26.7	3 19.4		12	52.0	+5 50.2	-0.7835	0.5509	0.2239	-5	-90
κ Aquarii	5.2	3.99	26.3	4 38.6		15	49.7	+8 41.9	+1.2216	0.5515	0.2253	+85	+37
207 B. Aquarii	6.3	+4.00	+26.7	-3 58.4		17	13.6	+10 3.0	+0.8562	0.5518	+0.2259	+86	+9
3 Piscium	6.3	4.08	28.4	0 14.8	13	2	18.4	-5 10.5	-0.8464	0.5540	0.2288	-8	-90
κ Piscium	4.9	4.21	28.9	+0 48.9		14	12.3	+6 19.0	+0.8196	0.5579	0.2301	+90	+7
9 Piscium	6.4	4.21	28.9	0 40.8		14	20.9	+6 27.4	+0.9871	0.5580	0.2301	+90	+17
16 Piscium	5.7	4.25	29.3	1 39.3		18	27.0	+10 24.9	+0.9518	0.5595	0.2298	+90	+15
19 Piscium	5.4	+4.30	+29.6	+3 2.4		22	54.1	-9 17.2	+0.5871	0.5613	+0.2290	+77	-6
36 Piscium	6.2	4.48	30.5	7 47.6	14	12	8.7	+3 29.4	-1.1423	0.5678	0.2238	-30	-82
d Piscium	5.4	4.50	30.4	7 44.6		13	53.5	+5 10.4	-0.7022	0.5687	0.2228	0	-82
136 B. Piscium	6.5	4.62	29.9	8 55.0		22	43.9	-10 18.3	+0.0796	0.5736	0.2164	+43	-32
75 Piscium	6.3	4.80	29.6	12 31.5	15	9	23.5	-0 2.3	-1.2305	0.5799	0.2060	-40	-77
101 Piscium	6.2	+4.97	+28.1	+14 15.0		21	24.1	+11 31.1	-0.5436	0.5872	+0.1905	+9	-66
20 H ¹ . Arietis	6.4	5.19	25.8	16 50.8	16	10	51.4	+0 27.2	-0.8761	0.5951	0.1685	+1	-72
27 Arietis	6.4	5.28	23.9	17 20.9		19	18.6	+8 34.4	+0.1886	0.5997	0.1523	+60	-18
36 Arietis	6.5	5.33	22.7	17 25.4	17	0	31.0	-10 25.8	+0.8799	0.6023	0.1414	+90	+22
40 Arietis	6.0	5.36	22.3	17 57.0		2	8.4	-8 52.4	+0.5901	0.6030	0.1379	+80	+4
45 Arietis	6.0	+5.38	+21.6	+18 0.4		4	56.4	-6 11.2	+0.9120	0.6042	+0.1317	+90	+25
ρ Arietis	5.6	5.39	21.4	17 42.2		5	10.5	-5 57.7	+1.2412	0.6043	0.1312	+88	+54
47 Arietis	5.8	5.48	21.5	20 20.8		5	47.1	-5 22.5	-1.2797	0.6046	0.1299	-55	-70
54 Arietis	6.5	5.43	20.3	18 29.2		9	44.3	-1 35.0	+1.0460	0.6062	0.1208	+90	+35
δ Arietis	4.5	5.48	20.0	19 25.4		10	58.6	-0 23.7	+0.2722	0.6066	0.1179	+55	-11
ζ Arietis	5.0	+5.52	+19.6	+20 44.8		12	13.0	+0 47.6	-0.8868	0.6070	+0.1149	-14	-69
τ Arietis	5.2	5.55	18.9	20 51.4		14	37.1	+3 5.8	-0.7270	0.6078	0.1092	-3	-69
63 Arietis	5.2	5.53	18.7	20 27.3		15	12.3	+3 39.6	-0.2669	0.6080	0.1078	+23	-39
65 Arietis	6.0	5.54	18.5	20 31.1		15	50.4	+4 16.1	-0.2616	0.6082	0.1062	+24	-39
14 H ¹ . Tauri	6.5	5.57	16.8	20 39.2		21	21.0	+9 33.1	+0.1523	0.6096	0.0925	+47	-15
22 H ¹ . Tauri	6.1	+5.59	+16.1	+20 40.5		23	24.7	+11 31.6	+0.3171	0.6100	+0.0873	+58	-5
133 B. Tauri	5.9	5.65	15.4	22 0.0	18	1	27.1	-10 31.0	-0.8186	0.6104	0.0821	-9	-68
32 Tauri	5.8	5.67	14.5	22 14.8		4	3.7	-8 0.8	-0.8578	0.6108	0.0753	-12	-68
Δ Tauri	4.5	5.67	13.6	21 51.8		7	0.6	-5 11.3	-0.2679	0.6110	0.0676	+23	-36
39 Tauri	6.1	5.67	13.4	21 47.5		7	14.9	-4 57.6	-0.1822	0.6110	0.0669	+28	-31
192 B. Tauri	6.1	+5.68	+12.5	+22 12.4		10	4.4	-2 15.1	-0.4146	0.6112	+0.0665	+16	-44

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S						AT CONJUNCTION I & R. A.						Limiting Parallels.			
	Name.	Mag.	Red'ns from 1918.0.		Apparent Declina- tion.	Greenwich Mean Time.			Hour Angle, H	Y'	x'	y'	N.	S.	
			$\Delta\alpha$	$\Delta\delta$		d	h	m.							
51	Tauri	5.6	+5.66	+11.8	+21 23.0	18	12	9.6	0 15.1	+0.5202	0.6112	+0.0539	+74	+9	
53	Tauri	5.3	5.64	11.7	20 56.9	12	33.7	+0 8.0	+0.9730	0.6112	0.0528	+90	+36		
56	Tauri	5.2	5.67	11.7	21 34.8	12	37.2	+0 11.4	+0.3500	0.6112	0.0527	+61	-1		
227 B.	Tauri	5.9	5.64	11.2	20 47.7	14	6.4	+1 36.8	+1.2040	0.6111	0.0487	+90	+57		
κ	Tauri	4.1	5.70	10.9	22 6.6	14	46.4	+2 15.1	-0.0691	0.6111	0.0469	+34	-23		
67	Tauri	5.4	+5.69	+10.9	+22 1.0	14	47.6	+2 16.3	+0.0250	0.6111	+0.0468	+40	-17		
ν	Tauri	4.2	5.72	10.7	22 37.9	15	7.2	+2 35.1	-0.5704	0.6110	0.0460	+6	-54		
72	Tauri	5.4	5.72	10.6	22 48.9	15	29.5	+2 56.4	-0.7362	0.6110	0.0450	-4	-67		
247 B.	Tauri	5.8	5.67	10.5	21 26.4	15	46.6	+3 12.9	+0.6415	0.6110	0.0442	+87	+16		
284 B.	Tauri	6.0	5.74	9.3	23 10.6	18	56.5	+6 14.9	-0.9569	0.6107	0.0357	-20	-67		
τ	Tauri	4.3	+5.72	+8.6	+22 48.2	21	7.1	+8 20.1	-0.5147	0.6104	+0.0299	+9	-49		
300 B.	Tauri	6.2	5.75	8.1	23 28.9	22	24.8	+9 34.5	-1.1535	0.6102	0.0264	-38	-67		
ι	Tauri	4.7	5.66	5.9	21 28.5	19	5	0.5	-8 6.2	+0.9614	0.6086	0.0086	+90	+39	
105	Tauri	6.0	5.65	5.3	21 35.9	6	50.4	-6 20.8	+0.8503	0.6080	+0.0037	+90	+32		
108	Tauri	6.2	5.67	4.2	22 11.6	9	41.9	-3 36.3	+0.2562	0.6070	-0.0039	+54	-1		
η	Tauri	5.1	+5.66	+3.6	+22 0.8	11	9.3	-2 12.5	+0.4276	0.6065	-0.0077	+67	+8		
θ	Tauri	4.8	5.63	2.6	21 52.1	14	21.2	+0 51.6	+0.5357	0.6052	0.0162	+76	+13		
ζ	Tauri	3.0	5.58	1.3	21 5.6	18	12.6	+4 33.6	+1.2345	0.6034	0.0262	+85	+62		
175 H.	Tauri	6.5	5.63	0.6	22 37.3	19	53.7	+6 10.6	-0.3497	0.6025	0.0305	+18	-38		
394 B.	Tauri	6.0	5.66	+0.2	23 10.0	20	22.4	+6 38.1	-0.9140	0.6023	0.0317	-17	-67		
141	Tauri	6.3	+5.57	-2.1	+22 24.0	20	3	32.2	-10 29.2	-0.4349	0.5982	-0.0497	+14	-45	
14 B.	Geminorum	6.0	5.54	3.1	22 12.2	6	37.6	-7 31.2	-0.4023	0.5962	0.0572	+16	-43		
6	Geminorum	6.3	5.56	3.6	22 55.6	7	42.7	-6 28.6	-1.2003	0.5955	0.0598	-44	-66		
η	Gemin. (var.)	3.2	5.54	3.9	22 31.8	8	44.0	-5 29.8	-0.8610	0.5948	0.0623	-13	-66		
μ	Geminorum	3.2	5.51	5.0	22 33.3	11	56.6	-2 24.7	-1.1004	0.5926	0.0698	-32	-66		
15	Geminorum	6.5	+5.42	-5.3	+20 50.4	13	53.9	-0 32.0	+0.5043	0.5912	-0.0743	+73	+5		
16	Geminorum	6.2	5.41	5.2	20 32.7	13	58.2	-0 27.9	+0.7986	0.5912	0.0745	+90	+23		
ν	Geminorum	4.1	5.40	5.2	20 15.8	14	22.9	-0 4.1	+1.0544	0.5909	0.0754	+90	+40		
ζ	Gemin. (var.)	3.7	5.26	9.7	20 41.3	21	4	45.0	-10 14.8	-0.6885	0.5797	0.1062	-1	-68	
f	Geminorum	5.3	4.98	13.1	17 51.5	19	51.3	+4 18.5	+0.4149	0.5670	0.1340	+65	-5		
g	Geminorum	5.0	+4.97	-14.1	+18 42.4	22	45.2	+7 6.1	-0.8634	0.5645	-0.1388	-11	-71		
1	Cancr	6.0	4.83	14.4	16 0.4	3	35.7	+11 46.5	+1.2628	0.5604	0.1464	+87	+54		
2 B.	Cancr	6.0	4.84	14.8	16 44.2	4	16.1	-11 34.5	+0.4013	0.5598	0.1474	+63	-8		
3	Cancr	5.7	4.85	15.2	17 31.8	5	16.2	-10 36.5	-0.5766	0.5589	0.1489	+6	-64		
5	Cancr	5.9	4.82	15.0	16 40.7	5	36.1	-10 17.3	+0.2647	0.5586	0.1494	+54	-15		
29	Cancr	5.9	+4.60	-17.0	+14 28.7	18	0.4	+1 41.9	+0.6185	0.5484	-0.1661	+82	-2		
84 B.	Cancr	6.4	4.55	17.2	13 32.0	20	24.7	+4 1.4	+1.2144	0.5465	0.1690	+89	+4		
90 B.	Cancr	6.3	4.59	18.0	15 35.6	21	29.9	+5 4.4	+1.1461	0.5456	0.1702	-32	-74		
A^1	Cancr	5.5	4.48	17.8	12 58.2	23	0	52.1	+8 20.0	+1.0480	0.5430	0.1740	+90	+28	
A^2	Cancr	5.7	4.44	18.0	12 24.4	2	38.9	+10 3.4	+1.3360	0.5416	0.1759	+72	+66		
60	Cancr	5.7	+4.38	-18.5	+11 56.1	6	57.5	-9 46.3	+1.0726	0.5384	-0.1803	+90	+29		
α	Cancr	4.3	4.37	18.8	12 10.2	8	11.3	-8 34.9	+0.5998	0.5376	0.1815	+79	-3		
κ	Cancr	5.1	4.29	19.0	10 59.6	12	42.3	-4 12.4	+1.0272	0.5343	0.1856	+90	+24		
209 B.	Cancr	6.5	4.29	19.5	11 53.6	13	41.4	-3 15.2	-0.1162	0.5337	0.1864	+32	-41		
222 B.	Cancr	6.3	4.24	20.0	11 50.4	17	40.4	+0 36.4	-0.8088	0.5310	0.1897	-6	-78		
ω	Leonis	5.5	+4.14	-19.9	+9 24.5	22	58.4	+5 44.7	+0.7810	0.5276	-0.1936	+90	+7		
h	Leonis	5.2	4.12	20.3	10 4.3	24	0	43.7	+7 26.7	-0.2722	0.5266	0.1948	+22	-51	
14	Sextantis	6.3	3.85	20.8	6 0.4	18	37.2	+0 48.2	+0.5439	0.5172	0.2042	+73	-8		
19	Sextantis	5.9	3.81	20.7	5 0.9	21	46.4	+3 51.9	+0.9760	0.5158	0.2053	+90	+18		
155 B.	Leonis	6.5	3.74	21.6	6 6.3	25	3	16.0	+9 12.0	-1.3428	0.5136	0.2070	-54	-80	
237 B.	Leonis	6.3	+3.56	-20.8	+1 27.3	18	45.0	+0 14.5	+0.5064	0.5090	-0.2096	+70	-10		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$	' "	d h m	h m				' "	' "
Leonis	6.1	+3.55	-20.8	+ 1 10.1	26 20 37.2	+ 2 3.6	+0.4279	0.5086	-0.2097	+64	-15
Leonis	6.1	3.50	20.7	0 26.1	26 0 53.8	+ 6 12.8	+0.3361	0.5078	0.2098	+58	-20
Leonis	5.3	3.44	20.8	+ 0 22.3	6 23.6	+11 33.5	-0.7463	0.5070	0.2096	- 2	-90
B. Leonis	6.3	3.36	20.4	- 1 15.2	14 4.7	- 4 58.4	-0.5649	0.5064	0.2086	+ 8	-75
Leonis	5.1	3.36	20.0	2 33.4	15 23.8	- 3 41.6	-0.5966	0.5063	0.2084	+78	- 6
B. Leonis	6.2	+3.32	-20.2	- 1 59.3	19 47.9	+ 0 35.3	-0.9460	0.5062	-0.2074	-15	-90
B. Virginis	5.9	3.27	19.4	4 53.0	27 2 40.8	+ 7 16.7	+0.8311	0.5063	0.2055	+85	+ 7
B. Virginis	6.5	3.17	19.0	5 16.1	15 17.8	- 4 27.4	-1.3060	0.5077	0.2006	-49	-88
Virginis	5.3	3.12	17.7	9 0.3	28 1 49.7	+ 5 46.7	+0.7525	0.5097	0.1949	+81	+ 3
B. Virginis	6.0	3.06	16.8	11 12.5	12 48.5	- 7 33.2	+1.0977	0.5127	0.1876	+79	+26
Virginis	5.0	+3.05	-17.3	- 9 5.9	12 49.9	- 7 31.8	-1.2490	0.5127	-0.1876	-43	-90
Virginis	5.2	3.02	16.6	10 18.4	19 59.9	- 0 34.1	-1.2330	0.5150	0.1820	-43	-90
Virginis	5.7	2.98	15.5	12 17.1	29 5 51.4	+ 9 0.2	-0.7887	0.5187	0.1733	-10	-90
B. Virginis	6.0	2.97	15.1	12 47.9	9 58.5	-11 0.1	-0.9248	0.5203	0.1692	-19	-90
Virginis	6.1	2.98	14.2	15 21.6	15 34.5	- 5 33.9	+0.9855	0.5228	0.1634	+75	+19
G. Virginis	6.5	+2.95	-13.2	-15 56.8	30 1 33.3	+ 4 7.0	+0.0619	0.5273	-0.1519	+34	-35
H. Virginis	5.1	+2.94	-13.0	-15 55.1	4 22.7	+ 6 51.2	-0.3936	0.5287	-0.1484	+ 9	-63

DECEMBER.

				NEW	MOON.						
B. Sagittarii	5.7	+3.12	+ 5.7	-21 27.9	5 7 21.2	+ 5 43.3	+0.4848	0.5627	+0.0800	+51	-11
B. Sagittarii	5.9	3.11	5.8	21 7.1	7 48.0	+ 6 9.1	+0.1495	0.5626	0.0809	+31	-30
B. Sagittarii	6.3	3.12	6.4	21 5.0	10 39.2	+ 8 54.3	+0.3509	0.5622	0.0865	+43	-18
Sagittarii	5.3	+3.12	+ 6.9	-20 25.0	12 36.4	+10 47.5	-0.1902	0.5620	+0.0904	+13	-50
Sagittarii	5.8	3.15	7.0	21 27.6	14 31.3	-11 21.6	+1.1007	0.5617	0.0941	+69	+31
Sagittarii	5.1	3.14	7.4	20 45.8	16 1.4	- 9 54.6	+0.4993	0.5614	0.0970	+54	-10
Sagittarii	3.7	3.15	7.3	21 12.8	16 11.3	- 9 45.0	+0.9971	0.5614	0.0974	+69	+22
B. Sagittarii	6.1	3.12	8.0	19 21.8	18 36.1	- 7 25.2	-0.7384	0.5610	0.1020	-16	-90
B. Sagittarii	6.4	+3.12	+ 8.1	-19 13.2	18 37.7	- 7 23.7	-0.8885	0.5610	+0.1021	-25	-90
B. Sagittarii	6.4	3.12	8.4	18 51.8	20 26.1	- 5 39.0	-1.0812	0.5606	0.1055	-39	-90
B. Sagittarii	5.4	3.13	8.5	19 25.0	20 56.1	- 5 10.1	-0.4369	0.5606	0.1064	+ 2	-67
B. Sagittarii	6.3	3.15	8.4	19 55.9	21 36.6	- 4 31.0	+0.1834	0.5604	0.1077	+35	-28
Sagittarii	5.0	3.14	9.2	19 5.8	6 1 8.2	- 1 6.7	-0.3139	0.5597	0.1142	+ 9	-58
B. Sagittarii	6.4	+3.16	+ 9.5	-19 23.2	2 55.4	+ 0 36.8	+0.2003	0.5593	+0.1175	+37	-27
Sagittarii	4.0	3.13	9.8	18 0.0	2 58.1	+ 0 39.4	-1.2693	0.5593	0.1176	-59	-83
Sagittarii	6.0	3.15	9.6	18 27.5	3 2.1	+ 0 43.3	-0.7734	0.5593	0.1177	-16	-90
B. Sagittarii	6.1	3.19	10.6	19 1.9	9 36.4	+ 7 4.1	+0.6484	0.5578	0.1294	+67	- 2
B. Sagittarii	5.8	3.18	10.8	18 24.7	9 53.8	+ 7 20.8	+0.0270	0.5577	0.1299	+29	-37
B. Capricorni	6.2	+3.23	+14.7	-15 2.4	7 5 52.1	+ 2 38.7	-0.6124	0.5527	+0.1619	- 2	-81
Capricorni	3.2	3.24	14.7	15 2.2	5 58.6	+ 2 44.9	-0.5980	0.5526	0.1621	- 1	-80
B. Capricorni	6.4	3.28	15.0	16 0.6	9 31.0	+ 6 10.2	+1.0083	0.5518	0.1672	+74	+21
G. Capricorni	6.2	3.27	15.2	15 19.6	10 36.5	+ 7 13.5	+0.4738	0.5515	0.1687	+60	-12
Capricorni	6.1	3.26	15.8	14 0.0	12 38.8	+ 8 37.9	-0.6756	0.5512	0.1707	- 5	-89
Capricorni	5.2	+3.30	+15.9	-15 14.3	14 23.9	+10 53.4	+1.0288	0.5506	+0.1739	+75	+22
B. Capricorni	6.0	3.30	17.2	12 50.6	19 43.2	- 7 58.0	-0.5405	0.5494	0.1807	+ 4	-74
Aquarii	4.5	3.35	18.7	11 41.9	8 4 32.4	+ 0 33.6	-0.0965	0.5475	0.1911	+29	-44
G. Aquarii	6.5	3.35	19.1	10 56.4	6 44.6	+ 2 41.5	-0.4656	0.5471	0.1935	-10	-68
Aquarii	6.3	3.36	20.0	9 39.8	10 48.9	+ 6 37.8	-0.9982	0.5464	0.1977	-22	-90
Aquarii	5.6	+3.38	+19.9	-10 5.6	11 52.7	+ 7 39.5	-0.3403	0.5462	+0.1988	+17	-53

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limit- ing Pos- itions.
Name.		Mag.	Red'ns from 1918.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	P	x'	y'	N. S.	
			$\Delta\alpha$	$\Delta\delta$								
			s	"	"	d h m	h m				"	
ξ	Aquarii	4.8	+3.42	+21.2	- 8 13.0	8 17 47.0	-10 37.8	-1.1002	0.5454	+0.2043	-28-30	
c^1	Capricorni	5.3	3.46	21.2	9 27.2	21 11.5	- 7 20.0	+0.8857	0.5450	0.2072	+81-41	
c^2	Capricorni	6.3	3.46	21.2	9 38.9	21 47.2	- 6 45.5	+1.2117	0.5450	0.2077	+80-45	
30	Aquarii	5.6	3.51	22.8	6 54.8	9 5 49.6	+ 1 1.3	+0.0700	0.5444	0.2137	+41-54	
138 B.	Aquarii	6.4	3.53	23.8	5 7.1	10 18.4	+ 5 21.3	-0.8188	0.5443	0.2165	- 8-40	
44	Aquarii	5.7	+3.56	+23.7	- 5 47.4	12 22.0	+ 7 20.8	+0.3218	0.5443	+0.2177	-56-21	
51	Aquarii	5.8	3.59	24.2	5 14.7	15 40.5	+10 32.9	+0.4829	0.5443	0.2195	+68-12	
187 B.	Aquarii	6.3	3.61	25.0	3 19.5	19 4.8	-10 9.5	-0.7447	0.5445	0.2211	- 3-40	
κ	Aquarii	5.2	3.65	24.6	4 38.7	22 6.9	- 7 13.4	+1.2852	0.5446	0.2223	-85-44	
207 B.	Aquarii	6.3	3.67	25.0	3 58.4	23 33.0	- 5 50.0	+0.9150	0.5448	0.2229	-86-13	
3	Piscium	6.3	+3.76	+26.8	- 0 14.8	10 8 52.9	+ 3 11.5	-0.8130	0.5460	+0.2253	- 6-40	
κ	Piscium	4.9	3.91	27.2	+ 0 48.8	21 8.8	- 8 56.9	+0.8744	0.5487	0.2260	+90-10	
9	Piscium	6.4	3.91	27.3	0 40.8	21 17.6	- 8 48.3	+1.0446	0.5487	0.2260	+90-21	
16	Piscium	5.7	3.95	27.7	1 39.3	11 31.9	- 4 42.5	+1.0078	0.5500	0.2256	+90-19	
19	Piscium	5.4	4.01	28.1	3 2.4	6 8.2	- 0 15.5	+0.6360	0.5515	0.2246	+82-4	
36	Piscium	6.2	+4.22	+29.3	+ 7 47.6	19 51.2	-11 0.3	-1.1274	0.5570	+0.2192	-28-82	
d	Piscium	5.4	4.25	29.3	7 44.6	21 39.9	- 9 15.3	-0.6804	0.5579	0.2182	+1-81	
136 B.	Piscium	6.5	4.39	28.9	8 54.9	12 6 50.1	- 0 24.3	+0.1116	0.5624	0.2119	+44-30	
75	Piscium	6.3	4.62	29.0	12 31.5	17 53.7	+10 15.8	-1.2251	0.5686	0.2016	-39-77	
101	Piscium	6.2	4.84	27.7	14 15.0	13 6 20.8	- 1 44.3	-0.5305	0.5761	0.1866	+ 9-65	
20 H ¹ .	Arietis	6.4	+5.14	+25.7	+16 50.8	20 16.3	+11 40.0	-0.6692	0.5848	+0.1653	+ 1-71	
27	Arietis	6.4	5.27	24.0	17 20.9	14 4 59.8	- 3 56.4	+0.2060	0.5901	0.1495	+50-17	
36	Arietis	6.5	5.35	22.7	17 25.4	10 21.7	+ 1 13.0	+0.9050	0.5932	0.1390	+90-23	
40	Arietis	6.0	5.39	22.4	17 57.0	12 1.9	+ 2 49.3	+0.6106	0.5941	0.1356	+82-6	
45	Arietis	6.0	5.43	21.6	18 0.4	14 54.7	+ 5 35.2	+0.9357	0.5956	0.1296	+90-26	
ρ	Arietis	5.6	+5.45	+21.3	+17 42.2	15 9.1	+ 5 49.1	+1.2691	0.5958	+0.1291	+83-59	
47	Arietis	5.8	5.54	21.9	20 20.8	15 46.8	+ 6 25.3	-1.2849	0.5961	0.1278	-56-70	
54	Arietis	6.5	5.52	20.4	18 29.2	19 50.3	+10 19.2	+1.0692	0.5982	0.1189	+90-37	
δ	Arietis	4.5	5.58	20.2	19 25.4	21 6.4	+11 32.3	+0.2854	0.5987	0.1161	+56-10	
ζ	Arietis	5.0	5.63	20.0	20 44.8	22 22.7	-11 14.5	-0.8878	0.5994	0.1132	-14-69	
τ	Arietis	5.2	+5.67	+19.3	+20 51.5	15 0 50.3	- 8 52.9	-0.7264	0.6004	+0.1076	- 3-69	
63	Arietis	5.2	5.66	19.1	20 27.3	1 26.3	- 8 18.3	-0.2611	0.6007	0.1062	+24-39	
65	Arietis	6.0	5.67	18.9	20 31.1	2 5.4	- 7 40.8	-0.2558	0.6010	0.1047	+24-38	
14 H ¹ .	Tauri	6.5	5.75	17.1	20 39.3	7 43.3	- 2 16.4	+0.1612	0.6032	0.0913	+48-14	
22 H ¹ .	Tauri	6.1	5.77	16.5	20 40.5	9 49.6	- 0 15.3	+0.3271	0.6039	0.0862	+59-5	
133 B.	Tauri	5.9	+5.85	+16.0	+22 0.0	11 54.3	+ 1 44.4	-0.8200	0.6046	+0.0810	-10-68	
32	Tauri	5.8	5.90	15.0	22 14.8	14 33.9	+ 4 17.5	-0.8597	0.6054	0.0744	-12-68	
A	Tauri	4.5	5.91	13.9	21 51.8	17 33.8	+ 7 10.1	-0.2649	0.6061	0.0668	+23-35	
39	Tauri	6.1	5.92	13.8	21 47.5	17 48.4	+ 7 24.0	-0.1786	0.6061	0.0662	+28-30	
192 B.	Tauri	6.1	5.95	12.9	22 12.4	20 40.6	+10 9.2	-0.4132	0.6068	0.0588	+15-44	
51	Tauri	5.6	+5.95	+12.1	+21 23.0	22 47.5	-11 49.1	+0.5283	0.6071	+0.0534	+75-9	
53	Tauri	5.3	5.92	11.9	20 56.9	23 12.0	-11 25.6	+0.9843	0.6071	0.0523	+90-37	
56	Tauri	5.2	5.95	11.9	21 34.8	23 15.6	-11 22.2	+0.3567	0.6071	0.0522	+61-0	
227 B.	Tauri	5.9	5.93	11.3	20 47.7	16 0 45.9	- 9 55.5	+1.2163	0.6073	0.0482	+89-58	
κ	Tauri	4.1	6.00	11.1	22 6.6	1 26.5	- 9 16.6	-0.0657	0.6074	0.0465	+35-22	
67	Tauri	5.4	+5.99	+11.1	+22 1.0	1 27.7	- 9 15.4	+0.0289	0.6074	+0.0464	+40-17	
v	Tauri	4.2	6.02	11.0	22 37.9	1 47.6	- 8 56.3	-0.5705	0.6074	0.0455	+ 6-54	
72	Tauri	5.4	6.02	11.0	22 48.9	2 10.1	- 8 34.7	-0.7374	0.6075	0.0445	- 4-67	
247 B.	Tauri	5.8	5.97	10.7	21 26.4	2 27.4	- 8 18.1	+0.6494	0.6075	0.0438	+89-17	
284 B.	Tauri	6.0	6.08	9.6	23 10.6	5 39.5	- 5 13.9	-0.9596	0.6077	0.0354	-20-67	
τ	Tauri	4.3	+6.07	+ 8.8	+22 48.2	7 51.5	- 3 7.3	-0.5147	0.6078	+0.0296	+ 9-49	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i> .	<i>Y'</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	s	d h m	h m				"	"
B. Tauri	6.2	+6.10	+ 8.4	+23 28.9	16 9 9.9	-1 52.2	-1.1570	0.6078	+0.0261	-38	-67
Tauri	4.7	6.05	5.7	21 28.5	15 48.6	+ 4 30.2	+0.9669	0.6073	0.0085	+90	+40
Tauri	6.0	6.06	5.1	21 35.9	17 39.1	+ 6 16.2	+0.8548	0.6071	+0.0036	+90	+32
Tauri	6.2	6.10	4.0	22 11.6	20 31.4	+ 9 1.5	+0.2581	0.6066	-0.0040	+54	- 1
Tauri	5.1	6.10	3.4	22 0.8	21 59.0	+10 25.4	+0.4298	0.6062	0.0079	+67	+ 8
Tauri	4.8	+6.10	+ 2.2	+21 52.1	17 1 11.3	-10 30.1	+0.5376	0.6054	-0.0162	+76	+13
Tauri	3.0	6.07	0.7	21 5.6	5 2.9	- 6 47.9	+1.2363	0.6043	0.0263	+85	+63
H. Tauri	6.5	6.14	+ 0.2	22 37.2	6 43.9	- 5 11.0	-0.3495	0.6037	0.0306	+18	-38
B. Tauri	6.0	6.17	- 0.1	23 10.0	7 12.6	- 4 43.4	-0.9143	0.6035	0.0319	-17	-67
Tauri	6.3	6.13	2.8	22 24.0	14 21.0	+ 2 7.8	-0.4345	0.6005	0.0499	+14	-45
B. Geminorum	6.0	+6.12	- 3.9	+22 12.2	17 25.4	+ 5 4.9	-0.4017	0.5990	-0.0575	+16	-43
Geminorum	6.3	6.15	4.3	22 55.6	18 30.2	+ 6 6.9	-1.1984	0.5985	0.0602	-43	-67
Gemin. (var.)	3.2	6.12	4.7	22 31.8	19 31.1	+ 7 5.5	-0.8596	0.5979	0.0626	-12	-67
Geminorum	3.2	6.12	6.0	22 33.3	22 42.2	+10 9.0	-1.0979	0.5962	0.0702	-31	-67
Geminorum	6.5	6.03	6.5	20 50.3	18 0 38.6	-11 59.1	+0.5030	0.5950	0.0748	+72	+ 6
Geminorum	6.2	+6.02	- 6.5	+20 32.7	0 42.8	-11 55.1	+0.7965	0.5950	-0.0750	+90	+23
Geminorum	4.1	6.01	6.6	20 15.8	1 7.3	-11 31.5	+1.0516	0.5947	0.0759	+90	+40
Gemin. (var.)	3.7	5.95	11.5	20 41.3	15 19.1	+ 2 7.5	-0.6845	0.5852	0.1072	0	-68
Geminorum	5.3	5.73	15.8	17 51.5	19 6 10.1	- 7 34.6	+0.4138	0.5738	0.1355	+65	- 5
Geminorum	5.0	5.73	16.8	18 42.4	9 0.6	- 4 50.3	-0.8548	0.5715	0.1404	-11	-71
B. Cancr	6.0	+5.60	-17.6	+16 0.3	13 45.2	- 0 15.8	+1.2555	0.5676	-0.1482	+88	+53
Cancr	6.0	5.62	17.9	16 44.1	14 24.8	+ 0 22.4	+0.4010	0.5671	0.1492	+63	- 7
Cancr	5.7	5.63	18.3	17 31.8	15 23.7	+ 1 19.1	-0.5688	0.5663	0.1507	+ 7	-64
Cancr	5.9	5.60	18.2	16 40.6	15 43.1	+ 1 37.9	+0.2656	0.5661	0.1512	+54	-15
Cancr	5.9	5.41	20.8	14 28.6	20 3 50.9	-10 39.6	+0.6179	0.5562	0.1683	+82	+ 2
B. Cancr	6.4	+5.36	-21.2	+13 31.9	6 11.8	- 8 23.5	+1.2085	0.5543	-0.1712	+90	+43
B. Cancr	6.3	5.41	21.8	15 35.5	7 15.5	- 7 21.9	-1.1297	0.5535	0.1725	-31	-74
Cancr	5.5	5.31	21.9	12 58.2	10 33.0	+ 4 11.1	+1.0443	0.5509	0.1764	+90	+28
Cancr	5.7	5.27	22.2	12 24.3	12 17.2	- 2 30.3	+1.3297	0.5496	0.1783	+75	+62
Cancr	5.7	5.22	22.9	11 56.0	16 29.6	+ 1 33.8	+1.0695	0.5463	0.1827	+90	+29
Cancr	4.3	+5.21	-23.2	+12 10.2	17 41.6	+ 2 43.4	+0.6016	0.5454	-0.1839	+79	- 1
Cancr	5.1	5.14	23.6	10 59.5	22 6.1	+ 6 59.3	+1.0257	0.5422	0.1881	+90	+25
B. Cancr	6.5	5.14	24.1	11 53.5	23 3.7	+ 7 55.1	-0.1061	0.5415	0.1889	+32	-40
B. Cancr	6.3	5.11	24.7	11 50.3	21 2 56.9	+11 40.9	-0.7908	0.5387	0.1922	- 6	-78
Leonis	5.5	5.00	24.8	9 24.5	8 7.2	- 7 18.7	+0.7841	0.5352	0.1961	+90	+ 7
Leonis	5.2	+4.99	-25.3	+10 4.3	9 50.0	- 5 39.1	-0.2581	0.5340	-0.1973	+24	-50
Leonis	4.9	4.81	26.6	8 25.8	23 56.9	+ 8 1.8	-1.3567	0.5255	0.2051	-60	-74
Sextantis	6.3	4.74	26.2	6 0.3	23 3 18.6	+11 17.4	+0.5542	0.5237	0.2065	+74	- 8
Sextantis	5.9	4.69	26.2	5 0.8	6 23.6	- 9 43.0	+0.9830	0.5222	0.2076	+90	+18
B. Leonis	6.5	4.63	27.1	6 6.2	11 46.2	- 4 30.1	-1.3126	0.5196	0.2092	-48	-84
B. Leonis	6.3	+4.46	-26.6	+ 1 10.0	23 2 57.3	+10 14.6	+0.5234	0.5138	-0.2114	+71	-10
Leonis	6.1	4.45	26.5	1 27.2	4 47.6	-11 58.3	+0.4461	0.5133	0.2114	+66	-14
Leonis	6.1	4.39	26.4	0 26.0	8 59.9	- 7 53.2	+0.3561	0.5121	0.2113	+59	-19
Leonis	5.3	4.34	26.6	+ 0 22.2	14 24.5	- 2 37.8	-0.7169	0.5108	0.2109	0	-90
B. Leonis	6.3	4.26	26.2	- 1 15.3	21 59.2	+ 4 43.9	-0.5357	0.5095	0.2097	+ 9	-72
Leonis	5.1	+4.26	-25.8	- 2 33.5	23 17.2	+ 5 59.7	+0.6183	0.5093	-0.2094	+80	- 5
B. Leonis	6.2	4.22	26.0	1 59.4	24 3 38.1	+10 13.2	-0.9135	0.5088	0.2083	-13	-90
B. Virginis	5.9	4.16	25.0	4 53.0	10 26.6	- 7 9.8	+0.8539	0.5084	0.2062	+85	+ 9
B. Virginis	6.5	4.05	24.5	5 16.2	22 57.4	+ 4 59.9	-1.2703	0.5087	0.2008	-44	-90
Virginis	5.3	3.99	22.9	9 0.4	25 9 25.9	- 8 49.4	+0.7801	0.5099	0.1949	+81	+ 5
B. Virginis	6.0	+3.93	-21.6	-11 12.6	20 22.6	+ 1 48.6	+1.1255	0.5121	-0.1874	+79	+23

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.				
Name.	Mag.	Red'ns from 1918.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>z'</i>	<i>y'</i>
		$\Delta\alpha$	$\Delta\delta$						
		<i>s</i>	<i>"</i>	<i>"</i>	<i>d h m</i>	<i>h m</i>			
ψ Virginis	5.0	+3.92	-22.4	- 9 6.0	25 20 24.0	+ 1 49.9	-1.2140	0.5121	-0.1874
49 Virginis	5.2	3.88	21.5	10 18.5	26 3 33.6	+ 8 47.2	-1.1985	0.5140	0.1816
ϵ Virginis	5.7	3.82	20.0	12 17.2	13 25.1	- 5 38.4	-0.7559	0.5172	0.1728
550 B. Virginis	6.0	3.80	19.4	12 48.0	17 32.6	- 1 38.2	-0.8922	0.5188	0.1687
85 Virginis	6.1	3.81	18.1	15 21.7	23 9.1	+ 3 48.4	+1.0144	0.5209	0.1628
214 G. Virginis	6.5	+3.75	-16.9	-15 56.9	27 9 9.4	-10 29.2	+0.0913	0.5252	-0.1514
40 H. Virginis	5.1	3.74	16.6	15 55.2	11 59.3	- 7 44.5	-0.3640	0.5265	0.1479
τ Libræ	4.7	3.64	11.5	19 29.1	28 18 2.4	- 2 37.6	-0.3523	0.5413	0.1047
25 Libræ	6.0	3.63	11.4	19 20.6	18 34.0	- 2 7.0	-0.4644	0.5416	0.1039
147 B. Libræ	6.2	3.62	9.9	20 27.0	29 2 44.1	+ 5 47.1	-0.0400	0.5456	0.0901
150 B. Libræ	6.1	+3.59	- 9.9	-19 53.3	3 16.3	+ 6 18.2	-0.7048	0.5459	-0.0892
11 H. Libræ	5.4	3.58	10.0	19 23.7	3 41.6	+ 6 42.7	-1.2834	0.5461	0.0884
172 B. Libræ	5.9	3.60	9.2	20 44.9	6 19.3	+ 9 15.2	-0.0247	0.5474	0.0838
10 G. Scorpii	5.9	3.56	7.6	20 44.9	15 19.7	- 6 2.2	-0.7053	0.5517	0.0674
δ Scorpii	2.5	3.59	7.1	22 23.5	16 31.7	- 4 52.6	+1.0115	0.5522	0.0651
ω^2 Scorpii	4.6	+3.54	- 6.9	-20 39.0	19 47.7	- 1 43.2	-1.0932	0.5536	-0.0589
84 B. Scorpii	6.3	3.53	6.3	20 54.1	23 1.4	+ 1 24.1	-0.9978	0.5550	0.0527
51 G. Scorpii	6.5	3.53	6.0	21 6.1	30 0 9.5	+ 2 29.8	-0.8371	0.5555	0.0505
ω Ophiuchi	4.5	3.50	4.7	21 17.6	7 0.9	+ 9 7.2	-0.9269	0.5582	0.0369
24 Ophiuchi	5.5	+3.50	- 2.4	-23 1.3	18 1.9	- 4 14.5	+0.6682	0.5620	-0.0142
NEW					MOON.				

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.		THE STAR'S		IMMERSION.				EMERSION.				Duration of Occultation.
				Washington.		Angle from—		Washington.		Angle from—		
Name.		Mag.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.		
a.	5	75 Virginis	5.6	h m 11 3	h m 16 2	° 97	° 129	h m 12 19	h m 17 18	° 326	° 343	h m 1 18
	6	231 G. Virginis	† 6.4	8 21	13 16	100	152	9 19	14 14	308	357	0 58
	6	236 G. Virginis	† 5.7	9 8	14 4	92	142	10 8	15 3	318	3	0 59
	7	64 G. Libræ	5.8	12 23	17 14	118	151	13 42	18 33	286	306	1 19
	8	41 G. Scorpil	6.3	13 10	17 57	116	150	14 26	19 13	274	296	1 16
	19	20 H ¹ . Arietis	6.4	4 49	8 54	119	68	5 40	9 45	208	154	0 51
	20	ζ Arietis	5.0	9 22	13 22	101	48	10 14	14 14	250	202	0 52
	21	161 B. Tauri	6.5	3 25	7 23	32	53	4 25	8 23	305	284	1 0
	22	99 Tauri	6.0	2 28	6 22	72	128	3 49	7 43	273	313	1 21
	23	1 Geminorum	4.3	8 17	12 6	91	37	9 31	13 20	297	239	1 14
	23	3 Geminorum	5.6	11 32	15 20	32	336	11 49	15 38	357	302	0 17
	23	6 Geminorum	6.3	12 32	16 20	54	2	13 7	16 55	331	282	0 35
	24	d Geminorum	5.2	3 16	7 1	105	162	4 34	8 20	268	320	1 19
	25	3 Cancr	5.7	14 5	17 45	138	86	14 53	18 33	264	214	0 48
	26	90 B. Cancr	6.3	4 27	8 5	104	158	5 44	9 22	293	343	1 17
	27	h Leonis	5.2	11 25	14 58	149	112	12 36	16 9	276	228	1 11
	29	p ³ Leonis	6.1	13 12	16 37	91	56	14 19	17 44	333	289	1 7
b.	3	43 B. Libræ	5.7	15 13	18 18	95	90	16 42	19 47	299	275	1 29
	5	126 B. Scorpil	† 6.1	11 58	14 55	69	116	12 53	15 50	317	358	0 56
	17	133 B. Tauri	5.9	7 20	9 31	133	76	8 9	10 20	222	165	0 48
	17	32 Tauri	† 5.8	10 21	12 32	81	30	11 13	13 24	278	231	0 52
	18	300 B. Tauri	6.2	5 48	7 55	98	58	7 11	9 18	264	208	1 23
	25	237 B. Leonis	† 6.3	16 3	17 41	137	86	17 0	18 38	273	222	0 57
	26	e Leonis	5.1	11 56	13 30	146	137	13 18	14 52	286	257	1 22
	28	370 B. Virginis	6.0	8 44	10 11	185	230	9 13	10 40	234	277	0 29
ur.	1	83 Virginis	5.6	11 7	12 30	149	182	12 18	13 41	272	291	1 10
	4	19 Scorpil	4.9	12 49	14 0	121	160	14 3	15 14	269	297	1 14
	17	72 Tauri	5.4	7 28	7 48	109	52	8 35	8 55	254	196	1 7
	19	μ Geminorum	3.2	7 20	7 33	72	35	8 30	8 42	318	265	1 10
	28	75 Virginis	5.6	14 13	13 49	174	164	15 3	14 39	242	220	0 50
	29	43 H. Virginis	5.5	9 51	9 24	146	191	10 51	10 24	266	306	1 0
	29	236 G. Virginis	5.7	12 30	12 2	187	210	12 59	12 32	229	246	0 30
	31	57 B. Scorpil	5.7	14 40	14 5	100	117	16 11	15 35	285	288	1 30
	31	27 G. Scorpil	5.8	16 30	15 55	90	84	18 0	17 24	282	258	1 30
ur.	2	4 Sagittarii	4.8	16 28	15 45	53	72	17 43	16 59	298	301	1 14
	3	30 Sagittarii	† 6.2	13 30	12 43	52	103	14 22	13 35	304	350	0 52
	4	57 Sagittarii	6.0	16 13	15 22	36	76	17 9	16 18	298	331	0 56
	7	κ Aquarii	† 5.2	16 32	15 29	30	82	17 16	16 13	285	336	0 44
	13	A Tauri	4.5	9 56	8 31	118	65	10 43	9 18	243	192	0 47
	13	39 Tauri	6.1	10 16	8 51	137	84	10 52	9 27	224	174	0 36
	15	141 Tauri	6.3	8 38	7 5	145	90	9 33	8 0	242	184	0 55
	15	14 B. Geminorum	6.0	12 13	10 39	90	37	13 4	11 30	295	245	0 51
	19	h Leonis	5.2	11 31	9 41	65	26	12 13	10 24	358	313	0 42
	21	p ³ Leonis	6.1	13 52	11 54	61	20	14 31	12 33	359	314	0 39
	22	13 B. Virginis	5.9	16 30	14 28	92	43	17 30	15 28	314	262	1 0
y	12	175 H ¹ . Tauri	† 6.5	12 22	9 2	61	11	13 1	9 41	317	270	0 39
	17	14 Sextantis	† 6.3	16 8	12 27	107	55	17 3	13 23	299	250	0 55
	19	e Leonis	5.1	13 18	9 30	58	28	13 54	10 6	5	329	0 36

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.
 † Immersion below the horizon of Washington. ‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	THE STAR'S		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	
May 22	83 Virginis	5.6	h m 11 58	h m 7 59	166	189	h m 12 57	h m 8 57	254	264	h m 0 58
26	39 Ophiuchi	5.1	13 12	8 57	150	193	13 56	9 40	226	263	0 43
26	191 B. Ophiuchi	6.3	17 7	12 52	105	108	18 31	14 15	248	233	1 24
26	b Ophiuchi	4.3	17 56	13 40	92	84	19 21	15 5	255	230	1 25
June 2	19 Piscium	5.4	18 16	13 33	30	82	19 5	14 21	278	329	0 48
12	α Cancri	† 4.3	15 18	9 55	174	123	15 44	10 21	231	181	0 28
18	75 Virginis	5.6	17 20	11 34	124	80	18 29	12 42	270	220	1 9
19	43 H. Virginis	5.5	12 48	6 58	87	106	14 6	8 16	325	326	1 18
19	231 G. Virginis	6.4	14 16	8 26	128	127	15 44	9 54	278	257	1 28
19	236 G. Virginis	5.7	15 27	9 37	122	105	16 53	11 8	276	243	1 25
21	57 B. Scorpii	5.7	17 8	11 10	119	104	18 26	12 28	249	220	1 18
21	27 G. Scorpii	5.8	18 53	12 55	132	98	19 50	13 51	228	187	0 56
23	4 Sagittarii	4.8	16 52	10 46	111	125	18 9	12 3	237	234	1 17
24	30 Sagittarii	† 6.2	13 22	7 12	122	174	14 13	8 4	233	279	0 51
25	57 Sagittarii	6.0	15 32	9 19	114	159	16 29	10 16	222	261	0 57
27	♄ Capricorni	6.3	18 24	12 2	41	82	19 31	13 9	267	297	1 7
28	κ Aquarii	5.2	17 34	11 8	93	143	18 30	12 4	217	263	0 56
28	207 B. Aquarii	6.3	19 32	13 6	34	75	20 38	14 12	266	296	1 5
July 20	51 Ophiuchi	4.8	15 21	7 29	65	91	16 37	8 45	298	310	1 16
23	τ Capricorni	5.2	0 26	16 20	40	358	1 22	17 17	268	219	0 56
31	Δ Tauri	4.5	23 53	15 16	67	125	1 0	16 24	262	318	1 7
31	39 Tauri	6.1	0 9	15 32	90	148	1 16	16 40	239	294	1 8
Aug. 2	141 Tauri	6.3	23 52	15 8	58	111	0 43	15 58	296	352	0 51
11	370 B. Virginis	6.0	15 59	6 40	110	71	17 15	7 56	294	247	1 16
18	π Sagittarii	3.0	21 36	11 50	82	51	22 45	12 58	236	195	1 8
27	14 H ¹ . Tauri	6.5	20 40	10 17	46	96	21 24	11 2	284	337	0 45
27	22 H ¹ . Tauri	6.1	22 50	12 28	122	179	23 31	13 8	203	260	0 40
Sept. 16	τ Capricorni	5.2	23 58	12 17	70	30	1 2	13 20	238	191	1 3
19	κ Piscium	4.9	0 7	12 14	76	61	1 17	13 23	220	189	1 9
19	9 Piscium	6.4	0 23	12 30	117	99	1 0	13 7	179	152	0 37
22	27 Arietis	6.4	4 49	16 43	78	30	6 0	17 54	254	200	1 11
24	51 Tauri	5.6	21 10	8 58	95	144	21 59	9 47	242	294	0 49
24	56 Tauri	5.2	21 40	9 27	66	117	22 31	10 19	270	325	0 52
24	67 Tauri	5.4	0 15	12 2	34	92	1 4	12 51	300	357	0 49
25	η Tauri	† 5.1	21 32	9 16	101	146	22 20	10 4	248	297	0 48
29	209 B. Cancri	6.5	5 21	16 47	105	157	6 39	18 6	299	343	1 18
Oct. 20	36 Arietis	6.5	20 16	6 22	93	145	21 4	7 9	229	283	0 48
20	40 Arietis	6.0	22 1	8 7	58	114	23 0	9 5	260	314	0 58
25	2 B. Cancri	6.0	3 9	12 53	155	210	3 48	13 33	227	281	0 40
25	5 Cancri	5.9	4 35	14 20	130	183	5 48	15 32	260	307	1 12
Nov. 7	21 G. Sagittarii	5.7	19 30	4 26	90	70	20 50	5 45	244	210	1 20
8	ε Sagittarii	3.7	20 54	5 45	126	100	21 38	6 29	195	162	0 44
8	36 Sagittarii	5.1	21 14	6 5	0	330	21 40	6 30	322	288	0 26
16	27 Arietis	6.4	6 43	15 0	49	354	7 35	15 52	291	236	0 52
18	51 Tauri	5.6	21 18	5 30	39	88	21 57	6 8	299	351	0 38
18	247 B. Tauri	5.8	1 12	9 23	137	193	1 49	10 0	200	254	0 37
19	o Tauri	4.8	23 21	7 28	86	139	0 17	8 24	262	318	0 56
20	15 Geminorum	† 6.5	23 1	7 4	79	126	23 51	7 54	282	333	0 50

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.
† Immersion below the horizon of Washington. ‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	THE STAR'S		IMMERSSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
v. 20	16 Geminorum	6.2	23 19	7 22	155	204	23 41	7 44	206	256	0 22
21	f Geminorum	5.3	5 43	13 42	128	172	7 1	14 59	265	284	1 18
23	ω Leonis	5.5	10 9	17 59	164	146	11 12	19 1	259	224	1 3
24	14 Sextantis	6.3	4 3	11 50	164	215	4 38	12 25	236	288	0 36
25	237 B. Leonis †	6.3	4 9	11 52	154	204	4 51	12 34	248	300	0 42
25	55 Leonis	6.1	5 55	13 38	136	187	7 0	14 42	275	322	1 4
e. 6	266 B. Sagittarii	6.1	21 48	4 49	66	37	23 2	6 2	247	207	1 13
7	27 G. Capricorni	6.2	23 6	6 2	45	12	0 13	7 9	261	219	1 8
9	44 Aquarii	5.7	1 6	7 54	39	1	2 11	8 59	261	215	1 5
14	40 Arietis	6.0	22 50	5 19	75	131	23 56	6 24	241	293	1 5
16	108 Tauri	6.2	10 6	16 25	27	330	10 25	16 44	349	293	0 19
16	η Tauri	5.1	11 28	17 47	50	358	12 3	18 22	325	275	0 35
19	2 B. Cancri	6.0	1 17	7 26	98	149	2 14	8 22	279	333	0 56
19	5 Cancri	5.9	2 35	8 44	87	141	3 37	9 46	295	349	1 2
23	ε Leonis	5.1	11 59	17 51	95	84	13 15	19 7	331	302	1 16

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.
 † Immersion below the horizon of Washington.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN.

FOR GREENWICH MEAN NOON.

Date.	P	B_0	L_0	Date.	P	B_0	L_0
	°	°	°		°	°	°
Jan. 1	+ 2.11	-3.13	25.20	July 5	- 0.99	+3.40	103.4
6	- 0.32	3.70	319.35	10	+ 1.29	3.92	37.5
11	2.74	4.24	253.51	15	3.54	4.41	331.0
16	5.12	4.74	187.68	20	5.74	4.87	264.9
21	7.43	5.21	121.84	25	7.90	5.30	198.7
26	- 9.65	-5.64	56.01	30	+ 9.97	+5.70	132.6
31	11.78	6.02	350.17	Aug. 4	11.97	6.06	66.51
Feb. 5	13.80	6.35	284.34	9	13.87	6.36	0.40
10	15.70	6.64	218.51	14	15.66	6.63	294.31
15	17.46	6.87	152.67	19	17.34	6.86	223.2
20	-19.08	-7.05	86.83	24	+18.90	+7.03	162.14
25	20.55	7.17	20.97	29	20.33	7.15	96.08
Mar. 2	21.86	7.24	315.11	Sept. 3	21.63	7.23	30.04
7	23.02	7.25	249.23	8	22.78	7.25	324.01
12	24.02	7.20	183.35	13	23.79	7.22	257.99
17	-24.85	-7.10	117.45	18	+24.64	+7.14	191.96
22	25.51	6.95	51.53	23	25.34	7.00	125.98
27	25.99	6.75	345.59	28	25.86	6.81	59.99
Apr. 1	26.30	6.50	279.63	Oct. 3	26.22	6.58	354.02
6	26.42	6.19	213.65	8	26.40	6.29	288.05
11	-26.37	-5.85	147.66	13	+26.40	+5.95	222.09
16	26.13	5.46	81.64	18	26.21	5.57	156.14
21	25.70	5.03	15.61	23	25.83	5.15	90.19
26	25.10	4.57	309.55	28	25.26	4.69	24.26
May 1	24.30	4.08	243.47	Nov. 2	24.49	4.19	318.32
6	-23.33	-3.56	177.38	7	+23.52	+3.66	252.40
11	22.18	3.02	111.27	12	22.35	3.10	186.48
16	20.86	2.45	45.14	17	21.00	2.51	120.57
21	19.38	1.87	339.00	22	19.46	1.90	54.66
26	17.75	1.28	272.85	27	17.74	1.28	348.76
31	-15.97	-0.68	206.68	Dec. 2	+15.86	+0.64	282.86
June 5	14.07	-0.08	140.51	7	13.83	0.00	216.98
10	12.06	+0.52	74.34	12	11.67	-0.64	151.10
15	9.95	1.12	8.16	17	9.41	1.27	85.22
20	7.77	1.71	301.97	22	7.07	1.90	19.35
25	- 5.54	+2.29	235.78	27	+ 4.67	-2.51	313.49
30	- 3.27	+2.86	169.60	32	+ 2.23	-3.10	247.64

In the above table, P is the position-angle of the axis of rotation measured eastward from the north point of the disk, while L_0 and B_0 are the heliographic longitudes and latitudes, respectively, of the center of the disk. The longitudes are reckoned from the Solar Meridian which passed through the ascending node of the Sun's equator on the ecliptic, on January 1, 1854, Greenwich Mean Noon.

MEAN EQUATOR, ORBIT, AND MEAN LONGITUDE.

FOR GREENWICH MEAN NOON.

Date.	Mean Equator.			Orbit.		Mean Longitude. C	Mean Solar Days.	Motion in Mean Longitude.
	i	A	Ω'	Γ'	Ω			
	" "	" "	" "	" "	" "	" "		" "
a. 0	23 28.1	87 31.7	3 51.4	346 41.8	271 3.7	132 4.8	0.1	1 19.06
10	23 29.0	87 0.0	3 51.3	347 48.6	270 31.9	263 50.6	0.2	2 38.12
20	23 29.8	86 28.4	3 51.2	348 55.5	270 0.1	35 36.5	0.3	3 57.18
30	23 30.7	85 56.8	3 51.0	350 2.3	269 28.3	167 22.3	0.4	5 16.23
b. 9	23 31.5	85 25.2	3 50.8	351 9.2	268 56.6	299 8.1	0.5	6 35.29
							0.6	7 54.35
19	23 32.4	84 53.6	3 50.7	352 16.0	268 24.8	70 54.0	0.7	9 13.41
r. 1	23 33.2	84 22.0	3 50.5	353 22.9	267 53.0	202 39.8	0.8	10 32.47
11	23 34.1	83 50.4	3 50.3	354 29.7	267 21.3	334 25.7	0.9	11 51.53
21	23 34.9	83 18.8	3 50.0	355 36.5	266 49.5	106 11.5	1.0	13 10.58
31	23 35.8	82 47.3	3 49.8	356 43.4	266 17.7	237 57.3	2.0	26 21.17
							3.0	39 31.75
r. 10	23 36.6	82 15.8	3 49.5	357 50.2	265 45.9	9 43.2	4.0	52 42.33
20	23 37.4	81 44.3	3 49.2	358 57.1	265 14.2	141 29.0	5.0	65 52.92
30	23 38.3	81 12.8	3 48.9	0 3.9	264 42.4	273 14.9	6.0	79 3.50
y 10	23 39.1	80 41.4	3 48.5	1 10.8	264 10.6	45 0.7	7.0	92 14.09
20	23 39.9	80 9.9	3 48.2	2 17.6	263 38.8	176 46.5	8.0	105 24.67
							9.0	118 35.25
30	23 40.8	79 38.5	3 47.8	3 24.4	263 7.1	308 32.4	10.0	131 45.84
ne 9	23 41.6	79 7.1	3 47.4	4 31.3	262 35.3	80 18.2	Hours.	" "
19	23 42.4	78 35.8	3 47.0	5 38.1	262 3.5	212 4.0	1	0 32.94
29	23 43.3	78 4.4	3 46.6	6 45.0	261 31.8	343 49.9	2	1 5.88
y 9	23 44.1	77 33.0	3 46.1	7 51.8	261 0.0	115 35.7	3	1 38.82
							4	2 11.76
19	23 44.9	77 1.7	3 45.7	8 58.7	260 28.2	247 21.6	5	2 44.70
29	23 45.8	76 30.4	3 45.2	10 5.5	259 56.4	19 7.4	6	3 17.65
g. 8	23 46.6	75 59.1	3 44.7	11 12.3	259 24.7	150 53.2	7	3 50.59
18	23 47.4	75 27.8	3 44.2	12 19.2	258 52.9	282 39.1	8	4 23.53
28	23 48.2	74 56.5	3 43.6	13 26.0	258 21.1	54 24.9	9	4 56.47
							10	5 29.41
pt. 7	23 49.1	74 25.3	3 43.1	14 32.9	257 49.3	186 10.7	11	6 2.35
17	23 49.9	73 54.0	3 42.5	15 39.7	257 17.6	317 56.6	12	6 35.29
27	23 50.7	73 22.8	3 41.9	16 46.5	256 45.8	89 42.4	13	7 8.23
t. 7	23 51.5	72 51.6	3 41.3	17 53.4	256 14.0	221 28.3	14	7 41.17
17	23 52.3	72 20.4	3 40.7	19 0.2	255 42.3	353 14.1	15	8 14.11
							16	8 47.06
27	23 53.1	71 49.2	3 40.0	20 7.1	255 10.5	124 59.9	17	9 20.00
iv. 6	23 53.9	71 18.1	3 39.3	21 13.9	254 38.7	256 45.8	18	9 52.94
16	23 54.7	70 46.9	3 38.7	22 20.8	254 6.9	28 31.6	19	10 25.88
26	23 55.5	70 15.8	3 38.0	23 27.6	253 35.2	160 17.5	20	10 58.82
c. 6	23 56.3	69 44.7	3 37.2	24 34.4	253 3.4	292 3.3	21	11 31.76
							22	12 4.70
16	23 57.1	69 13.6	3 36.5	25 41.3	252 31.6	63 49.1	23	12 37.64
26	23 57.9	68 42.6	3 35.8	26 48.1	251 59.9	195 35.0		
36	23 58.7	68 11.5	3 35.0	27 55.0	251 28.1	327 20.8		

Daily motion of Γ' +6'.684Daily motion of Ω -3'.177

**EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON
FOR GREENWICH MEAN MIDNIGHT**

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
Jan. 1	+0.88	+6.03	0.00	+0.04	140.94	+0.30	30
2	-0.37	6.57	0.00	0.04	153.08	0.32	22
3	1.65	6.83	0.00	0.04	165.23	0.34	23
4	2.90	6.80	0.00	0.04	177.38	0.36	23
5	4.05	6.47	-0.01	0.04	189.54	0.38	26
6	-5.02	+5.86	-0.01	+0.04	201.71	+0.40	21
7	5.75	4.96	0.01	0.04	213.88	0.41	11
8	6.16	3.79	0.01	0.04	226.05	0.43	1
9	6.21	2.40	0.01	0.04	238.24	0.45	
10	5.87	+0.84	0.01	0.04	250.42	0.47	
11	-5.14	-0.82	-0.01	+0.04	262.61	+0.50	35
12	4.06	2.46	0.01	0.04	274.80	0.52	35
13	2.70	3.97	0.01	0.04	286.99	0.55	34
14	-1.15	5.22	0.01	0.04	299.18	0.58	3
15	+0.44	6.13	0.01	0.04	311.36	0.61	3
16	+1.96	-6.64	-0.01	+0.04	323.54	+0.64	3
17	3.31	6.70	0.01	0.04	335.72	0.67	3
18	4.40	6.35	0.01	0.04	347.89	0.70	3
19	5.19	5.63	-0.01	0.04	0.04	0.74	3
20	5.68	4.60	0.00	0.04	12.20	0.77	3
21	+5.86	-3.33	0.00	+0.04	24.35	+0.81	3
22	5.78	1.90	0.00	0.04	36.49	0.84	3
23	5.46	-0.41	0.00	0.04	48.63	0.87	3
24	4.94	+1.09	0.00	0.04	60.76	0.90	
25	4.25	2.51	0.00	0.04	72.90	0.94	
26	+3.40	+3.79	-0.01	+0.04	85.03	+0.96	
27	2.42	4.88	0.01	0.04	97.16	0.99	
28	1.32	5.75	0.01	0.04	109.29	1.01	
29	+0.13	6.35	0.01	0.04	121.43	1.03	
30	-1.13	6.67	0.01	0.04	133.56	1.05	
31	-2.41	+6.71	-0.01	+0.04	145.71	+1.06	
Feb. 1	3.68	6.47	0.01	0.04	157.86	1.08	
2	4.88	5.94	0.01	0.04	170.01	1.09	
3	5.92	5.14	0.01	0.04	182.17	1.10	
4	6.74	4.09	0.01	0.04	194.34	1.11	
5	-7.26	+2.82	-0.01	+0.04	206.51	+1.11	
6	7.39	+1.37	0.01	0.04	218.69	1.12	
7	7.09	-0.21	0.01	0.04	230.87	1.13	
8	6.31	1.82	0.01	0.04	243.06	1.14	3
9	5.06	3.36	0.01	0.04	255.25	1.16	3
10	-3.42	-4.71	-0.01	+0.04	267.45	+1.17	3
11	-1.50	5.75	0.01	0.04	279.65	1.19	3
12	+0.53	6.40	0.01	0.04	291.85	1.21	3
13	2.49	6.59	0.01	0.04	304.04	1.23	3
14	4.20	6.33	0.01	0.04	316.23	1.25	3
15	+5.56	-5.66	-0.01	+0.04	328.42	+1.27	3
16	+6.48	-4.66	-0.01	+0.04	340.60	+1.29	3

EPIHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
16	+6.48	-4.66	-0.01	+0.04	340.60	+1.29	341.32
17	6.96	3.42	0.01	0.04	352.77	1.32	345.52
18	7.04	2.03	0.01	0.04	4.94	1.34	350.53
19	6.76	-0.56	0.01	0.04	17.10	1.37	355.98
20	6.20	+0.91	0.01	0.04	29.25	1.39	1.46
21	+5.42	+2.30	-0.01	+0.04	41.40	+1.41	6.65
22	4.48	3.57	0.01	0.04	53.55	1.43	11.32
23	3.42	4.66	0.01	0.04	65.70	1.45	15.34
24	2.28	5.54	0.01	0.04	77.84	1.47	18.62
25	+1.08	6.16	0.01	0.04	89.98	1.48	21.13
26	-0.17	+6.52	-0.01	+0.04	102.13	+1.49	22.82
27	1.44	6.59	0.02	0.04	114.27	1.50	23.64
28	2.71	6.38	0.02	0.04	126.42	1.50	23.54
ar. 1	3.96	5.89	0.02	0.04	138.57	1.50	22.47
2	5.15	5.14	0.02	0.04	150.72	1.50	20.39
3	-6.21	+4.16	-0.02	+0.04	162.88	+1.50	17.28
4	7.08	2.96	0.02	0.04	175.05	1.50	13.19
5	7.69	1.60	0.02	0.04	187.23	1.49	8.26
6	7.95	+0.12	0.02	0.04	199.41	1.48	2.74
7	7.78	-1.41	0.02	0.04	211.59	1.48	356.97
8	-7.13	-2.90	-0.02	+0.04	223.79	+1.48	351.33
9	5.97	4.27	0.02	0.04	235.99	1.48	346.20
10	4.34	5.39	0.02	0.04	248.20	1.48	341.89
11	2.34	6.16	0.02	0.04	260.40	1.48	338.66
12	-0.14	6.49	0.02	0.04	272.62	1.48	336.75
13	+2.05	-6.36	-0.02	+0.04	284.83	+1.48	336.30
14	4.03	5.77	0.02	0.04	297.04	1.49	337.42
15	5.64	4.81	0.02	0.04	309.25	1.49	340.07
16	6.78	3.57	0.01	0.04	321.45	1.50	344.04
17	7.41	2.15	0.01	0.04	333.64	1.51	349.00
18	+7.56	-0.65	-0.01	+0.04	345.83	+1.52	354.50
19	7.29	+0.84	0.01	0.04	358.02	1.53	0.10
20	6.67	2.24	0.01	0.04	10.20	1.54	5.44
21	5.80	3.51	0.01	0.04	22.37	1.55	10.27
22	4.74	4.61	0.01	0.04	34.54	1.56	14.45
23	+3.56	+5.48	-0.01	+0.04	46.70	+1.57	17.92
24	2.32	6.12	0.01	0.04	58.87	1.57	20.61
25	+1.05	6.48	0.02	0.04	71.03	1.57	22.51
26	-0.22	6.57	0.02	0.04	83.19	1.57	23.55
27	1.48	6.37	0.02	0.04	95.34	1.57	23.69
28	-2.70	+5.89	-0.02	+0.04	107.50	+1.56	22.86
29	3.87	5.16	0.02	0.04	119.66	1.55	21.01
30	4.96	4.18	0.02	0.04	131.83	1.53	18.14
31	5.94	3.01	0.02	0.04	144.00	1.52	14.29
1	6.75	1.67	0.02	0.04	156.17	1.50	9.60
2	-7.33	+0.23	-0.02	+0.04	168.35	+1.48	4.30
3	-7.61	-1.25	-0.02	+0.04	180.54	+1.46	358.71

EPIHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
Apr.							
1	-6.75	+1.67	-0.02	+0.04	156.17	+1.50	9.00
2	7.33	+0.23	0.02	0.04	168.35	1.48	4.30
3	7.61	-1.25	0.02	0.04	180.54	1.46	358.71
4	7.53	2.71	0.02	0.04	192.73	1.44	353.16
5	7.02	4.05	0.02	0.04	204.93	1.42	347.96
6	-6.05	-5.19	-0.02	+0.04	217.14	+1.40	343.47
7	4.63	6.03	0.02	0.04	229.35	1.39	339.87
8	2.84	6.48	0.02	0.04	241.57	1.37	337.40
9	-0.80	6.49	0.02	0.04	253.80	1.36	336.28
10	+1.31	6.03	0.02	0.04	266.02	1.35	336.68
11	+3.28	-5.15	-0.02	+0.04	278.25	+1.34	338.68
12	4.96	3.93	0.01	0.04	290.48	1.33	342.19
13	6.20	2.48	0.01	0.04	302.70	1.32	346.94
14	6.97	-0.93	0.01	0.04	314.92	1.32	352.46
15	7.25	+0.63	0.01	0.04	327.14	1.31	358.25
16	+7.08	+2.12	-0.01	+0.04	339.35	+1.31	3.85
17	6.54	3.45	0.01	0.04	351.55	1.30	8.96
18	5.71	4.59	0.01	0.04	3.75	1.30	13.40
19	4.65	5.51	0.01	0.04	15.94	1.30	17.10
20	3.46	6.17	0.01	0.04	28.13	1.29	20.02
21	+2.19	+6.56	-0.01	+0.04	40.32	+1.28	22.13
22	+0.90	6.67	0.01	0.04	52.50	1.28	23.41
23	-0.37	6.50	0.02	0.04	64.68	1.26	23.79
24	1.58	6.04	0.02	0.04	76.85	1.25	23.21
25	2.71	5.31	0.02	0.04	89.03	1.23	21.62
26	-3.74	+4.34	-0.02	+0.04	101.20	+1.21	18.97
27	4.65	3.16	0.02	0.04	113.38	1.18	15.31
28	5.43	1.81	0.02	0.04	125.56	1.16	10.77
29	6.03	+0.35	0.02	0.04	137.74	1.13	5.56
30	6.42	-1.14	0.02	0.04	149.92	1.10	0.02
May							
1	-6.56	-2.61	-0.02	+0.04	162.12	+1.07	354.48
2	6.40	3.97	0.02	0.04	174.32	1.04	349.28
3	5.92	5.13	0.02	0.04	186.52	1.01	344.67
4	5.07	6.01	0.02	0.04	198.73	0.98	340.88
5	3.88	6.54	0.02	0.04	210.95	0.95	338.09
6	-2.40	-6.66	-0.01	+0.04	223.18	+0.92	336.50
7	-0.72	6.34	0.01	0.04	235.41	0.90	336.28
8	+1.03	5.58	0.01	0.04	247.65	0.87	337.59
9	2.71	4.45	0.01	0.04	259.89	0.85	340.45
10	4.17	3.04	0.01	0.04	272.13	0.83	344.72
11	+5.30	-1.46	-0.01	+0.04	284.38	+0.81	350.04
12	6.05	+0.18	0.01	0.04	296.61	0.79	355.89
13	6.37	1.76	0.01	0.04	308.85	0.78	1.75
14	6.28	3.20	0.01	0.04	321.08	0.76	7.20
15	5.83	4.44	0.01	0.04	333.31	0.75	12.00
16	+5.07	+5.45	-0.01	+0.04	345.53	+0.73	16.03
17	+4.07	+6.18	-0.01	+0.04	357.75	+0.72	19.24

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
May 17	+4.07	+6.18	-0.01	+0.04	357.75	+0.72	19.24
18	2.92	6.64	0.01	0.04	9.96	0.71	21.63
19	1.67	6.81	0.01	0.04	22.17	0.69	23.17
20	+0.40	6.68	0.01	0.04	34.37	0.68	23.82
21	-0.84	6.27	0.01	0.04	46.56	0.66	23.53
22	-1.99	+5.59	-0.01	+0.04	58.76	+0.64	22.23
23	3.02	4.64	0.01	0.04	70.95	0.61	19.88
24	3.89	3.48	0.01	0.04	83.14	0.59	16.47
25	4.58	2.12	0.01	0.04	95.32	0.56	12.09
26	5.07	+0.65	0.01	0.04	107.51	0.52	6.96
27	-5.34	-0.89	-0.01	+0.04	119.70	+0.49	1.39
28	5.40	2.40	0.01	0.04	131.89	0.46	355.75
29	5.22	3.81	0.01	0.04	144.08	0.42	350.40
30	4.80	5.02	0.01	0.04	156.28	0.38	345.63
31	4.14	5.96	0.01	0.04	168.49	0.35	341.66
June 1	-3.27	-6.56	-0.01	+0.04	180.71	+0.32	338.65
2	2.20	6.77	0.01	0.04	192.93	0.28	336.77
3	-0.99	6.56	0.01	0.04	205.16	0.25	336.15
4	+0.31	5.93	0.01	0.04	217.39	0.22	336.94
5	1.61	4.92	-0.01	0.04	229.63	0.19	339.21
6	+2.82	-3.60	0.00	+0.04	241.88	+0.16	342.91
7	3.88	2.06	0.00	0.04	254.13	0.13	347.80
8	4.69	-0.43	0.00	0.04	266.38	0.10	353.48
9	5.21	+1.21	0.00	0.04	278.63	0.08	359.42
10	5.41	2.74	0.00	0.04	290.88	0.05	5.13
11	+5.28	+4.09	0.00	+0.04	303.13	+0.03	10.28
12	4.84	5.20	0.00	0.04	315.37	+0.01	14.68
13	4.11	6.04	0.00	0.04	327.61	0.00	18.25
14	3.16	6.59	0.00	0.04	339.84	-0.02	20.96
15	2.04	6.84	0.00	0.04	352.07	0.04	22.80
16	+0.81	+6.80	0.00	+0.04	4.29	-0.06	23.75
17	-0.45	6.46	0.00	0.04	16.51	0.08	23.77
18	1.68	5.86	0.00	0.04	28.72	0.10	22.80
19	2.79	4.98	0.00	0.04	40.93	0.12	20.80
20	3.74	3.88	0.00	0.04	53.13	0.14	17.74
21	-4.48	+2.56	0.00	+0.04	65.33	-0.16	13.65
22	4.96	+1.10	0.00	0.04	77.53	0.19	8.70
23	5.15	-0.44	0.00	0.04	89.72	0.22	3.16
24	5.06	2.00	0.00	0.04	101.91	0.26	357.40
25	4.69	3.47	0.00	0.04	114.10	0.29	351.82
26	-4.07	-4.76	0.00	+0.04	126.30	-0.32	346.76
27	3.24	5.78	0.00	0.04	138.50	0.36	342.49
28	2.25	6.46	0.00	0.04	150.70	0.39	339.21
29	1.16	6.75	0.00	0.04	162.91	0.42	337.05
30	-0.05	6.62	0.00	0.04	175.12	0.45	336.14
July 1	+1.04	-6.09	0.00	+0.04	187.35	-0.48	338.58
2	+2.05	-5.18	0.00	+0.04	199.58	-0.52	338.44

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		c	
	Long.	Lat.	Long.	Lat.	Colong.	Lat.		
July	1	+1.04	−6.09	0.00	+0.04	187.35	−0.48	336.56
	2	2.05	5.18	0.00	0.04	199.58	0.52	338.44
	3	2.95	3.96	0.00	0.04	211.82	0.55	341.60
	4	3.72	2.51	+0.01	0.04	224.06	0.58	346.16
	5	4.30	−0.94	0.01	0.04	236.30	0.60	351.53
	6	+4.69	+0.68	+0.01	+0.04	248.56	−0.63	357.34
	7	4.86	2.22	0.01	0.04	260.81	0.66	3.13
	8	4.80	3.63	0.01	0.04	273.06	0.68	8.51
	9	4.50	4.82	0.01	0.04	285.31	0.70	13.21
	10	3.96	5.74	0.01	0.04	297.56	0.72	17.12
	11	+3.18	+6.39	+0.01	+0.04	309.81	−0.74	20.16
	12	2.21	6.73	0.01	0.04	322.05	0.76	22.31
	13	+1.07	6.77	0.01	0.04	334.29	0.77	23.57
	14	−0.16	6.52	0.01	0.04	346.52	0.79	23.99
	15	1.44	5.99	0.01	0.04	358.75	0.80	23.27
	16	−2.69	+5.21	+0.01	+0.04	10.97	−0.82	21.63
	17	3.82	4.18	0.01	0.04	23.19	0.84	18.96
	18	4.76	2.96	0.00	0.04	35.40	0.85	15.25
	19	5.43	1.56	0.00	0.04	47.60	0.87	10.62
	20	5.78	+0.06	0.00	0.04	59.80	0.89	5.27
	21	−5.76	−1.48	+0.01	+0.04	71.99	−0.91	359.52
	22	5.35	2.98	0.01	0.04	84.18	0.94	353.77
	23	4.57	4.34	0.01	0.04	96.37	0.96	348.39
	24	3.48	5.46	0.01	0.04	108.56	0.98	343.72
	25	2.17	6.24	0.01	0.04	120.76	1.01	340.02
	26	−0.74	−6.62	+0.01	+0.04	132.95	−1.03	337.47
	27	+0.68	6.57	0.01	0.04	145.15	1.06	336.20
	28	2.00	6.10	0.01	0.04	157.35	1.08	336.33
	29	3.13	5.26	0.01	0.04	169.56	1.10	337.89
	30	4.03	4.10	0.01	0.04	181.78	1.13	340.84
	31	+4.69	−2.72	+0.01	+0.04	194.00	−1.15	345.01
Aug.	1	5.11	−1.20	0.01	0.04	206.23	1.17	350.13
	2	5.31	+0.36	0.01	0.04	218.47	1.20	355.77
	3	5.30	1.88	0.02	0.04	230.71	1.22	1.51
	4	5.11	3.27	0.02	0.04	242.95	1.24	6.96
	5	+4.74	+4.48	+0.02	+0.04	255.20	−1.26	11.85
	6	4.18	5.45	0.02	0.04	267.45	1.27	15.99
	7	3.46	6.15	0.02	0.04	279.70	1.29	19.31
	8	2.56	6.55	0.02	0.04	291.94	1.30	21.76
	9	1.50	6.65	0.02	0.04	304.19	1.31	23.31
	10	+0.31	+6.46	+0.02	+0.04	316.43	−1.32	23.93
	11	−0.97	6.00	0.01	0.04	328.66	1.32	23.60
	12	2.30	5.28	0.01	0.04	340.89	1.34	22.28
	13	3.59	4.33	0.01	0.04	353.11	1.35	19.96
	14	4.77	3.18	0.01	0.04	5.33	1.35	16.64
	15	−5.76	+1.87	+0.01	+0.04	17.54	−1.36	12.39
	16	−6.45	+0.44	+0.01	+0.04	29.75	−1.37	7.37

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C		
	Long.	Lat.	Long.	Lat.	Colong.	Lat.			
Aug.	16	-6.45	+0.44	+0.01	+0.04	29.75	-1.37	7.37	
	17	6.79	-1.05	0.01	0.04	41.94	1.38	1.81	
	18	6.68	2.52	0.01	0.04	54.14	1.38	356.07	
	19	6.10	3.90	0.01	0.04	66.32	1.39	350.51	
	20	5.07	5.08	0.01	0.04	78.51	1.40	345.49	
	21	-3.63	-5.95	+0.01	+0.04	90.69	-1.41	341.31	
	22	1.91	6.45	0.01	0.03	102.86	1.42	338.23	
	23	-0.05	6.50	0.02	0.03	115.04	1.43	336.45	
	24	+1.77	6.11	0.02	0.03	127.23	1.44	336.12	
	25	3.39	5.31	0.02	0.03	139.41	1.45	337.29	
	26	+4.72	-4.18	+0.02	+0.03	151.61	-1.46	339.96	
	27	5.68	2.81	0.02	0.03	163.81	1.47	343.94	
	28	6.29	-1.30	0.02	0.03	176.01	1.48	348.92	
	29	6.56	+0.24	0.02	0.04	188.22	1.48	354.49	
	30	6.53	1.74	0.02	0.04	200.44	1.50	0.21	
	Sept.	31	+6.25	+3.12	+0.02	+0.04	212.66	-1.52	5.71
		1	5.76	4.32	0.02	0.04	224.89	1.52	10.70
		2	5.11	5.30	0.02	0.04	237.12	1.53	15.00
		3	4.31	6.01	0.02	0.04	249.36	1.54	18.53
		4	3.38	6.43	0.02	0.04	261.59	1.55	21.21
		5	+2.33	+6.57	+0.02	+0.04	273.83	-1.56	23.00
		6	+1.16	6.41	0.02	0.04	286.06	1.56	23.89
		7	-0.10	5.98	0.02	0.04	298.30	1.56	23.82
		8	1.43	5.28	0.02	0.04	310.53	1.56	22.78
		9	2.79	4.37	0.02	0.04	322.75	1.56	20.74
		10	-4.12	+3.26	+0.02	+0.04	334.97	-1.55	17.72
		11	5.34	2.00	0.02	0.04	347.19	1.54	13.80
		12	6.38	+0.63	0.02	0.04	359.40	1.54	9.09
		13	7.15	-0.80	0.02	0.04	11.60	1.53	3.81
		14	7.54	2.23	0.02	0.04	23.79	1.53	358.24
		15	-7.49	-3.59	+0.02	+0.04	35.98	-1.52	352.71
16		6.93	4.79	0.02	0.03	48.16	1.51	347.52	
17		5.85	5.73	0.02	0.03	60.33	1.51	343.00	
18		4.29	6.33	0.02	0.03	72.50	1.50	339.42	
19		2.38	6.51	0.02	0.03	84.67	1.50	337.02	
20		-0.26	-6.23	+0.02	+0.03	96.83	-1.49	336.04	
21		+1.85	5.50	0.02	0.03	109.00	1.48	336.63	
22		3.77	4.40	0.02	0.03	121.16	1.47	338.83	
23		5.36	3.01	0.02	0.03	133.34	1.47	342.52	
24		6.53	-1.46	0.02	0.03	145.51	1.46	347.39	
25		+7.25	+0.13	+0.02	+0.03	157.69	-1.46	352.99	
26		7.56	1.67	0.02	0.03	169.88	1.45	358.82	
27		7.48	3.08	0.02	0.03	182.07	1.45	4.47	
28		7.10	4.31	0.02	0.03	194.27	1.44	9.62	
29		6.46	5.29	0.03	0.04	206.48	1.44	14.09	
Oct.		30	+5.62	+6.02	+0.03	+0.04	218.69	-1.44	17.79
	1	+4.64	+6.46	+0.03	+0.04	230.90	-1.44	20.87	

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
Oct.	1	+4.64	+6.46	+0.03	+0.04	230.90	−1.44	20.67
	2	3.54	6.61	0.02	0.04	243.12	1.43	22.66
	3	2.35	6.46	0.02	0.04	255.34	1.43	23.79
	4	+1.09	6.04	0.02	0.04	267.56	1.42	23.96
	5	−0.23	5.36	0.02	0.04	279.78	1.41	23.16
	6	−1.57	+4.45	+0.02	+0.04	292.00	−1.40	21.37
	7	2.91	3.35	0.02	0.04	304.22	1.39	18.59
	8	4.21	2.09	0.02	0.04	316.43	1.38	14.89
	9	5.40	+0.73	0.02	0.04	328.63	1.36	10.40
	10	6.42	−0.69	0.02	0.03	340.84	1.34	5.33
	11	−7.20	−2.10	+0.02	+0.03	353.03	−1.32	359.93
	12	7.65	3.44	0.02	0.03	5.22	1.30	354.50
	13	7.69	4.64	0.02	0.03	17.40	1.28	349.32
	14	7.26	5.63	0.02	0.03	29.58	1.26	344.66
	15	6.32	6.31	0.02	0.03	41.74	1.24	340.77
	16	−4.90	−6.61	+0.02	+0.03	53.89	−1.22	337.89
	17	3.08	6.47	0.02	0.03	66.06	1.20	336.27
	18	−1.01	5.88	0.02	0.03	78.21	1.18	336.12
	19	+1.15	4.86	0.02	0.03	90.36	1.15	337.60
	20	3.20	3.50	0.02	0.03	102.50	1.13	340.73
	21	+4.96	−1.91	+0.02	+0.03	114.65	−1.10	345.29
	22	6.34	−0.23	0.02	0.03	126.81	1.08	350.85
	23	7.20	+1.42	0.02	0.03	138.96	1.06	356.86
	24	7.72	2.93	0.02	0.03	151.13	1.04	2.79
	25	7.76	4.24	0.02	0.03	163.30	1.02	8.25
	26	+7.42	+5.30	+0.02	+0.03	175.47	−1.01	13.01
	27	6.77	6.08	0.02	0.03	187.65	0.99	16.96
	28	5.88	6.56	0.02	0.03	199.84	0.98	20.07
	29	4.80	6.74	0.02	0.03	212.03	0.96	22.30
	30	3.60	6.63	0.02	0.03	224.23	0.95	23.64
	31	+2.32	+6.23	+0.02	+0.03	236.43	−0.94	24.05
Nov.	1	+1.00	5.57	0.02	0.04	248.63	0.92	23.50
	2	−0.32	4.66	0.02	0.03	260.84	0.90	21.94
	3	1.62	3.56	0.02	0.03	273.04	0.89	19.39
	4	2.88	2.29	0.02	0.03	285.25	0.87	15.88
	5	−4.04	+0.91	+0.02	+0.03	297.45	−0.84	11.54
	6	5.09	−0.53	0.02	0.03	309.65	0.82	6.56
	7	5.96	1.96	0.02	0.03	321.84	0.80	1.22
	8	6.61	3.33	0.02	0.03	334.03	0.77	355.82
	9	6.98	4.55	0.01	0.03	346.22	0.74	350.63
	10	−7.02	−5.57	+0.01	+0.03	358.39	−0.71	345.92
	11	6.68	6.31	0.01	0.03	10.56	0.68	341.90
	12	5.94	6.70	0.01	0.03	22.72	0.65	338.76
	13	4.79	6.70	0.01	0.03	34.88	0.62	336.70
	14	3.29	6.26	0.01	0.03	47.03	0.59	335.95
	15	−1.54	−5.40	+0.02	+0.03	59.17	−0.55	336.69
	16	+0.35	−4.15	+0.02	+0.03	71.31	−0.52	339.06

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
ov. 16	+0.35	-4.15	+0.02	+0.03	71.31	-0.52	339.05
17	2.22	2.61	0.02	0.03	83.44	0.48	342.98
18	3.92	-0.91	0.02	0.03	95.58	0.45	348.20
19	5.34	+0.83	0.02	0.03	107.71	0.41	354.20
20	6.38	2.48	0.02	0.03	119.85	0.38	0.39
21	+7.00	+3.93	+0.02	+0.03	131.99	-0.35	6.26
22	7.19	5.12	0.02	0.03	144.14	0.32	11.45
23	6.99	6.01	0.02	0.03	156.29	0.30	15.80
24	6.42	6.58	0.02	0.03	168.45	0.27	19.25
25	5.57	6.84	0.02	0.03	180.61	0.25	21.78
26	+4.50	+6.78	+0.02	+0.03	192.78	-0.23	23.40
27	3.27	6.44	0.02	0.03	204.96	0.22	24.08
28	1.95	5.83	0.02	0.03	217.14	0.20	23.79
29	+0.61	4.96	0.02	0.03	229.32	0.18	22.51
30	-0.70	3.89	0.02	0.03	241.51	0.16	20.22
ec. 1	-1.93	+2.63	+0.01	+0.03	253.70	-0.14	16.95
2	3.04	+1.25	0.01	0.03	265.89	0.12	12.78
3	4.00	-0.21	0.01	0.03	278.08	0.09	7.89
4	4.78	1.68	0.01	0.03	290.28	0.06	2.55
5	5.35	3.09	0.01	0.03	302.47	0.04	357.06
6	-5.70	-4.36	+0.01	+0.03	314.66	-0.01	351.76
7	5.80	5.43	0.01	0.03	326.84	+0.02	346.91
8	5.65	6.23	0.01	0.03	339.02	0.05	342.73
9	5.23	6.70	0.01	0.03	351.19	0.08	339.41
10	4.55	6.78	0.01	0.03	3.35	0.12	337.11
11	-3.62	-6.47	+0.01	+0.03	15.50	+0.15	335.99
12	2.47	5.75	0.01	0.03	27.65	0.19	336.22
13	-1.15	4.66	0.01	0.03	39.80	0.22	337.93
14	+0.27	3.26	0.01	0.03	51.93	0.26	341.16
15	1.70	-1.63	0.01	0.03	64.06	0.30	345.78
16	+3.07	+0.09	+0.01	+0.03	76.19	+0.34	351.45
17	4.26	1.79	0.01	0.03	88.31	0.37	357.62
18	5.19	3.35	0.01	0.03	100.44	0.41	3.75
19	5.80	4.67	0.01	0.03	112.57	0.44	9.37
20	6.06	5.70	0.01	0.03	124.70	0.48	14.19
21	+5.94	+6.40	+0.01	+0.03	136.83	+0.50	18.10
22	5.47	6.77	0.01	0.03	148.98	0.53	21.03
23	4.68	6.81	0.01	0.03	161.12	0.55	23.00
24	3.65	6.55	0.01	0.03	173.28	0.57	24.00
25	2.43	6.00	0.01	0.03	185.43	0.58	24.02
26	+1.11	+5.21	+0.01	+0.03	197.60	+0.60	23.06
27	-0.24	4.19	0.01	0.03	209.77	0.62	21.08
28	1.54	2.99	+0.01	0.03	221.94	0.64	18.12
29	2.70	1.65	0.00	0.03	234.13	0.65	14.22
30	3.68	+0.21	0.00	0.03	246.31	0.67	9.52
31	-4.43	-1.26	0.00	+0.03	258.50	+0.69	4.24
32	-4.91	-2.70	0.00	+0.03	270.69	+0.71	358.89

622 ILLUMINATED DISK OF MERCURY, 1918.

FOR GREENWICH MEAN NOON.

Date.	<i>k</i>	<i>i</i>	θ	<i>L</i>	Stellar Mag.	Date.	<i>k</i>	<i>i</i>	θ	<i>L</i>	Stellar Mag.
		°	°					°	°		
Jan. 1	0.019	164	328	4.8	+2.3	July 5	0.929	31	359	52.5	-1.1
6	0.045	155	200	10.5	2.0	10	0.856	45	6	44.6	0.7
11	0.209	126	189	35.2	0.9	15	0.781	56	12	38.8	-0.3
16	0.390	103	185	44.6	0.4	20	0.709	65	16	35.1	0.0
21	0.535	86	181	42.5	0.2	25	0.640	74	19	33.0	+0.2
26	0.642	73	177	37.7	+0.1	30	0.571	82	22	32.0	+0.4
31	0.722	64	173	33.3	0.0	Aug. 4	0.499	90	24	31.7	0.6
Feb. 5	0.782	56	169	30.1	0.0	9	0.419	99	27	31.4	0.7
10	0.830	49	165	28.1	-0.1	14	0.328	110	30	30.2	0.9
15	0.869	42	160	27.4	0.2	19	0.225	123	33	26.1	1.2
20	0.903	36	156	27.7	-0.3	24	0.118	140	39	17.3	+1.7
25	0.934	30	151	29.2	0.5	29	0.032	159	55	5.8	2.5
Mar. 2	0.962	22	146	32.3	0.7	Sept. 3	0.012	168	149	2.2	2.8
7	0.986	14	136	37.2	1.1	8	0.090	145	190	17.1	1.7
12	0.998	5	86	44.7	1.4	13	0.265	118	199	43.2	+0.6
17	0.987	13	350	54.7	-1.5	18	0.491	91	204	63.8	-0.2
22	0.930	31	338	65.1	1.3	23	0.704	66	208	68.4	0.7
27	0.810	52	335	71.0	1.0	28	0.856	45	211	60.7	1.0
Apr. 1	0.633	75	333	67.0	-0.5	Oct. 3	0.943	28	215	49.6	1.1
6	0.440	97	333	54.2	+0.1	8	0.984	14	220	40.2	1.1
11	0.266	118	332	37.5	+0.8	13	0.998	4	240	33.5	-1.1
16	0.129	138	330	20.6	1.6	18	0.998	5	5	29.1	0.9
21	0.038	158	326	6.6	2.4	23	0.990	12	19	26.4	0.7
26	0.001	176	291	0.2	3.4	28	0.975	18	21	25.2	0.6
May 1	0.019	164	159	3.2	2.8	Nov. 2	0.956	24	21	25.0	0.4
6	0.078	148	154	11.7	+2.1	7	0.932	30	20	26.0	-0.4
11	0.158	133	152	20.3	1.6	12	0.898	37	17	28.2	0.3
16	0.246	121	152	26.6	1.2	17	0.853	45	15	31.8	0.3
21	0.335	109	153	30.9	0.9	22	0.790	55	12	37.2	0.3
26	0.425	99	154	34.5	0.6	27	0.697	67	8	44.5	0.2
31	0.519	88	156	38.5	+0.3	Dec. 2	0.560	83	5	51.9	-0.1
5	0.620	76	159	43.6	0.0	7	0.369	105	2	52.0	+0.3
10	0.732	62	163	50.6	-0.4	12	0.148	135	359	30.8	1.1
15	0.847	46	168	58.9	0.9	17	0.008	170	330	2.1	2.6
20	0.945	27	177	65.8	1.4	22	0.067	150	201	15.4	1.7
25	0.996	7	207	67.0	-1.8	27	0.258	119	195	42.0	+0.7
30	0.985	14	344	61.3	-1.6	32	0.451	96	192	48.8	+0.2

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i=the angle between the Sun and Earth, as seen from the planet.

θ =the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L=the brilliancy of the disk. The unit of *L* is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR GREENWICH MEAN NOON.

ate.	k	i	θ	L	Stellar Mag.	Date.	k	i	θ	L	Stellar Mag.
		°	°					°	°		
1	0.295	114.2	341.0	218.4	-4.4	July 5	0.791	54.4	168.1	70.2	-3.4
6	0.254	119.5	339.4	220.0	4.4	10	0.806	52.3	170.6	68.1	3.4
11	0.210	125.5	337.6	213.6	4.4	15	0.820	50.2	173.2	66.2	3.4
16	0.164	132.2	335.3	195.9	4.3	20	0.834	48.2	176.0	64.4	3.4
21	0.118	139.8	332.2	164.2	4.2	25	0.847	46.1	178.8	62.8	3.4
26	0.075	148.2	327.1	119.3	-4.0	30	0.859	44.1	181.7	61.4	-3.4
31	0.039	157.2	317.8	69.3	3.7	Aug. 4	0.871	42.1	184.7	60.0	3.4
5	0.016	165.5	296.2	30.1	3.4	9	0.883	40.0	187.6	58.8	3.3
10	0.010	168.7	247.1	18.4	3.3	14	0.894	38.0	190.4	57.6	3.3
15	0.021	163.2	206.5	39.0	3.5	19	0.904	36.0	193.2	56.6	3.3
20	0.048	154.6	190.0	81.4	-3.8	24	0.914	34.0	195.8	55.6	-3.3
25	0.086	145.8	182.1	127.9	4.0	29	0.924	32.0	198.2	54.8	3.3
2	0.130	137.8	177.3	165.9	4.2	Sept. 3	0.933	30.0	200.5	54.0	3.3
7	0.175	130.5	173.9	190.4	4.3	8	0.941	28.1	202.6	53.2	3.3
12	0.220	124.0	171.1	202.6	4.3	13	0.949	26.1	204.5	52.5	3.3
17	0.263	118.3	168.8	205.2	-4.3	18	0.956	24.1	206.1	51.9	-3.4
22	0.303	113.2	166.6	201.5	4.3	23	0.963	22.3	207.5	51.3	3.4
27	0.341	108.5	164.7	194.0	4.2	28	0.969	20.4	208.7	50.8	3.4
1	0.376	104.3	162.9	184.6	4.2	Oct. 3	0.974	18.5	209.7	50.2	3.4
6	0.409	100.4	161.3	174.4	4.2	8	0.979	16.6	210.4	49.8	3.4
11	0.440	96.9	159.8	164.0	-4.1	13	0.984	14.8	210.9	49.4	-3.4
16	0.469	93.5	158.6	154.0	4.0	18	0.987	12.9	211.2	49.0	3.4
21	0.496	90.4	157.5	144.6	4.0	23	0.991	11.1	211.3	48.7	3.4
26	0.522	87.4	156.6	135.8	4.0	28	0.993	9.3	211.3	48.4	3.4
1	0.547	84.6	155.9	127.7	3.9	Nov. 2	0.996	7.6	211.2	48.1	3.4
6	0.570	81.9	155.4	120.3	-3.8	7	0.997	5.8	211.2	47.9	-3.5
11	0.593	79.3	155.2	113.7	3.8	12	0.999	4.1	212.0	47.7	3.5
16	0.614	76.8	155.2	107.5	3.8	17	0.999	2.4	215.5	47.6	3.5
21	0.635	74.3	155.4	102.0	3.7	22	1.000	0.8	241.2	47.4	3.5
26	0.655	72.0	155.9	96.9	3.7	27	1.000	1.2	354.6	47.4	3.5
31	0.674	69.6	156.6	92.3	-3.6	Dec. 2	0.999	2.8	6.8	47.4	-3.5
5	0.692	67.4	157.6	88.2	3.6	7	0.998	4.5	8.1	47.4	3.5
10	0.710	65.1	158.8	84.4	3.6	12	0.997	6.1	7.1	47.5	3.4
15	0.728	62.9	160.2	81.0	3.5	17	0.995	7.7	5.3	47.6	3.4
20	0.744	60.8	161.8	77.9	3.5	22	0.993	9.4	3.1	47.8	3.4
25	0.760	58.6	163.7	75.1	-3.5	27	0.991	11.0	0.7	47.9	-3.4
30	0.776	56.5	165.8	72.6	-3.5	32	0.988	12.6	358.2	48.2	-3.4

NOTATION.

k = the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i = the angle between the Sun and Earth, as seen from the planet.

θ = the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L = the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

Date.	Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180^{\circ}$	D_{\oplus}	$A_{\odot}-A_{\oplus}$	D_{\odot}	\odot_{δ}
	m		.	.	.	.	.	.
Jan. 1	9.44	+0.6	24.33	269.31	+22.73	-37.62	+19.24	54.18
3	9.28	0.6	24.63	269.98	22.67	37.38	19.46	55.06
5	9.13	0.5	24.91	270.62	22.62	37.12	19.68	55.93
7	8.97	0.5	25.17	271.23	22.56	36.83	19.88	56.81
9	8.82	0.4	25.42	271.80	22.49	36.50	20.09	57.68
11	8.66	+0.4	25.65	272.34	+22.43	-36.13	+20.29	58.56
13	8.51	0.4	25.86	272.84	22.36	35.72	20.48	59.43
15	8.36	0.3	26.05	273.31	22.30	35.28	20.67	60.31
17	8.21	0.3	26.23	273.74	22.23	34.79	20.86	61.18
19	8.06	0.2	26.39	274.12	22.16	34.26	21.04	62.06
21	7.92	+0.2	26.53	274.46	+22.10	-33.68	+21.22	62.93
23	7.77	0.2	26.65	274.76	22.04	33.06	21.39	63.80
25	7.63	+0.1	26.76	275.02	21.98	32.40	21.55	64.68
27	7.49	0.0	26.84	275.23	21.92	31.69	21.71	65.55
29	7.36	0.0	26.91	275.39	21.86	30.92	21.87	66.42
31	7.22	-0.1	26.95	275.50	+21.80	-30.11	+22.02	67.29
Feb. 2	7.09	0.1	26.98	275.57	21.76	29.24	22.16	68.17
4	6.96	0.2	26.98	275.57	21.71	28.32	22.30	69.04
6	6.84	0.2	26.96	275.53	21.66	27.34	22.44	69.91
8	6.72	0.3	26.93	275.43	21.63	26.30	22.57	70.79
10	6.61	-0.3	26.86	275.27	+21.59	-25.21	+22.69	71.66
12	6.50	0.4	26.78	275.06	21.56	24.06	22.81	72.54
14	6.39	0.4	26.67	274.80	21.54	22.86	22.92	73.41
16	6.29	0.5	26.54	274.47	21.52	21.59	23.03	74.28
18	6.19	0.6	26.39	274.10	21.51	20.27	23.13	75.16
20	6.10	-0.6	26.21	273.66	+21.50	-18.89	+23.23	76.03
22	6.01	0.7	26.01	273.18	21.49	17.46	23.32	76.91
24	5.93	0.7	25.79	272.64	21.49	15.97	23.40	77.78
26	5.86	0.8	25.55	272.06	21.50	14.44	23.48	78.66
28	5.79	0.8	25.28	271.42	21.50	12.85	23.56	79.54
Mar. 2	5.73	-0.8	24.99	270.75	+21.52	-11.22	+23.62	80.42
4	5.67	0.9	24.69	270.04	21.53	9.55	23.69	81.29
6	5.63	0.9	24.36	269.28	21.54	7.84	23.74	82.17
8	5.59	1.0	24.02	268.50	21.56	6.10	23.79	83.01
10	5.55	1.0	23.66	267.70	21.59	4.33	23.84	83.93
12	5.53	-1.0	23.29	266.87	+21.61	- 2.54	+23.88	84.82
14	5.51	1.1	22.91	266.03	21.63	- 0.73	23.91	85.70
16	5.50	1.1	22.52	265.19	21.66	+ 1.08	23.94	86.58
18	5.50	1.0	22.12	264.34	21.68	2.88	23.96	87.46
20	5.50	1.0	21.73	263.51	21.71	4.69	23.97	88.35
22	5.51	-1.0	21.34	262.68	+21.74	+ 6.48	+23.98	89.24
24	5.53	1.0	20.96	261.88	21.77	8.26	23.98	90.12
26	5.55	0.9	20.58	261.10	21.80	10.01	23.98	91.01
28	5.58	0.9	20.21	260.35	21.84	11.73	23.97	91.90
30	5.62	0.9	19.86	259.63	21.87	13.42	23.95	92.79
Apr. 1	5.67	-0.8	19.53	258.95	+21.91	+15.08	+23.93	93.68
3	5.72	-0.8	19.21	258.32	+21.95	+16.69	+23.90	94.58

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

Date.	k	Diameter.	i	q	Q	Central Meridian.	Mean Time of Transit of Zero Meridian.	
							Of Date.	Of Intermediate Date.
		"	"	"	"	"	h m	h m
1	0.909	8.89	35.20	0.81	292.84	123.82	16 10.1	16 48.8
3	0.910	9.04	34.94	0.81	292.77	104.97	17 27.5	18 6.2
5	0.911	9.20	34.66	0.82	292.68	86.15	18 44.8	19 23.3
7	0.913	9.36	34.35	0.82	292.59	67.37	20 1.8	20 40.4
9	0.914	9.52	34.01	0.81	292.49	48.61	21 18.8	21 57.2
11	0.916	9.69	33.64	0.81	292.38	29.89	22 35.6	23 14.0
13	0.918	9.86	33.23	0.81	292.27	11.21	23 52.3	...
15	0.920	10.04	32.79	0.80	292.14	352.57	0 30.5	1 8.7
17	0.923	10.22	32.32	0.79	292.01	333.96	1 46.9	2 25.0
19	0.926	10.41	31.80	0.78	291.87	315.40	3 3.1	3 41.2
21	0.928	10.60	31.26	0.77	291.72	296.87	4 19.2	4 57.1
23	0.930	10.80	30.66	0.76	291.56	278.39	5 35.0	6 12.9
25	0.933	11.00	30.03	0.74	291.39	259.96	6 50.7	7 28.4
27	0.936	11.20	29.36	0.72	291.20	241.56	8 6.2	8 43.8
29	0.939	11.41	28.65	0.70	291.00	223.22	9 21.4	9 59.0
31	0.942	11.62	27.89	0.68	290.79	204.92	10 36.4	11 13.9
2	0.945	11.83	27.08	0.65	290.56	186.68	11 51.3	12 28.6
4	0.948	12.05	26.22	0.62	290.31	168.48	13 5.9	13 43.1
6	0.952	12.27	25.32	0.59	290.04	150.34	14 20.2	14 57.4
8	0.956	12.49	24.36	0.56	289.74	132.26	15 34.4	16 11.4
10	0.959	12.70	23.35	0.52	289.40	114.22	16 48.3	17 25.2
12	0.963	12.92	22.29	0.48	289.03	96.25	18 2.0	18 38.7
14	0.966	13.14	21.18	0.44	288.61	78.32	19 15.4	19 52.0
16	0.970	13.35	20.02	0.40	288.14	60.45	20 28.6	21 5.1
18	0.973	13.56	18.81	0.36	287.60	42.64	21 41.6	22 18.0
20	0.977	13.76	17.54	0.32	286.98	24.88	22 54.3	23 30.6
22	0.980	13.96	16.23	0.28	286.26	7.17	...	0 6.8
24	0.983	14.15	14.88	0.24	285.39	349.51	0 43.0	1 19.2
26	0.986	14.33	13.48	0.20	284.34	331.90	1 55.2	2 31.2
28	0.989	14.49	12.04	0.16	283.04	314.33	3 7.2	3 43.2
2	0.992	14.65	10.57	0.12	281.36	296.80	4 19.1	4 54.9
4	0.994	14.79	9.08	0.09	279.12	279.31	5 30.8	6 6.6
6	0.996	14.91	7.56	0.06	275.98	261.86	6 42.3	7 18.0
8	0.997	15.02	6.05	0.04	271.25	244.43	7 53.7	8 29.4
10	0.998	15.11	4.59	0.02	263.44	227.03	9 5.0	9 40.7
12	0.999	15.18	3.26	0.01	248.70	209.65	10 16.3	10 51.9
14	0.999	15.23	2.38	0.01	219.25	192.28	11 27.5	12 3.1
16	0.999	15.26	2.48	0.01	179.22	174.91	12 38.7	13 14.3
18	0.999	15.27	3.49	0.01	153.21	157.54	13 49.9	14 25.5
20	0.998	15.26	4.87	0.03	140.23	140.16	15 1.1	15 36.8
22	0.997	15.23	6.38	0.05	133.12	122.76	16 12.5	16 48.2
24	0.995	15.18	7.93	0.07	128.72	105.35	17 23.9	17 59.6
26	0.993	15.11	9.47	0.10	125.75	87.90	18 35.4	19 11.3
28	0.991	15.03	11.01	0.14	123.60	70.43	19 47.1	20 23.0
30	0.988	14.93	12.53	0.18	121.97	52.92	20 59.0	21 35.0
1	0.985	14.81	14.02	0.22	120.69	35.37	22 11.0	22 47.1
3	0.982	14.68	15.48	0.27	119.64	17.78	23 23.2	23 59.4

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

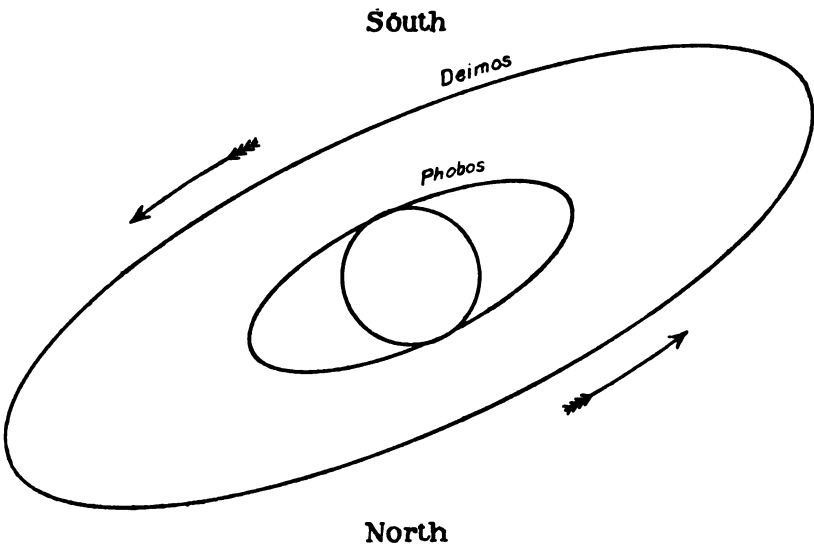
Date.	Light-Time.	Stellar Magnitude.	P	$A_{\oplus} + 180^{\circ}$	D_{\oplus}	$A_{\odot} - A_{\oplus}$	D_{\odot}	\odot_z
	m		.	.	.	.	.	.
Apr. 1	5.67	-0.8	19.53	258.95	+21.91	+15.08	+23.93	93.68
3	5.72	0.8	19.21	258.32	21.95	16.69	23.90	94.58
5	5.78	0.8	18.91	257.73	22.00	18.25	23.86	95.47
7	5.84	0.7	18.64	257.19	22.04	19.77	23.82	96.37
9	5.90	0.7	18.39	256.71	22.09	21.24	23.78	97.26
11	5.98	-0.6	18.17	256.27	+22.15	+22.65	+23.72	98.16
13	6.06	0.6	17.98	255.90	22.21	24.01	23.66	99.06
15	6.14	0.5	17.81	255.57	22.27	25.31	23.60	99.97
17	6.22	0.5	17.67	255.31	22.34	26.56	23.52	100.87
19	6.31	0.4	17.56	255.10	22.41	27.75	23.44	101.77
21	6.41	-0.4	17.48	254.95	+22.48	+28.88	+23.36	102.68
23	6.51	0.4	17.42	254.86	22.56	29.96	23.27	103.59
25	6.61	0.3	17.40	254.81	22.64	30.99	23.17	104.50
27	6.71	0.3	17.40	254.83	22.73	31.96	23.07	105.41
29	6.82	0.2	17.43	254.89	22.82	32.88	22.96	106.33
May 1	6.92	-0.2	17.49	255.01	+22.91	+33.75	+22.84	107.24
3	7.04	0.1	17.57	255.17	23.01	34.57	22.72	108.16
5	7.15	0.1	17.68	255.39	23.11	35.34	22.59	109.08
7	7.26	-0.1	17.81	255.65	23.21	36.07	22.45	110.00
9	7.38	0.0	17.96	255.96	23.31	36.75	22.31	110.92
11	7.50	0.0	18.14	256.32	+23.41	+37.38	+22.16	111.85
13	7.62	+0.1	18.34	256.71	23.52	37.97	22.01	112.78
15	7.74	0.1	18.55	257.15	23.62	38.52	21.85	113.71
17	7.86	0.1	18.79	257.64	23.72	39.02	21.68	114.64
19	7.98	0.2	19.05	258.16	23.82	39.49	21.51	115.57
21	8.10	+0.2	19.32	258.72	+23.92	+39.92	+21.33	116.51
23	8.23	0.3	19.62	259.31	24.02	40.31	21.14	117.45
25	8.35	0.3	19.92	259.94	24.12	40.67	20.95	118.39
27	8.48	0.3	20.24	260.60	24.22	41.00	20.75	119.34
29	8.60	0.4	20.58	261.29	24.31	41.29	20.55	120.28
31	8.73	+0.4	20.93	262.02	+24.40	+41.55	+20.34	121.23
June 2	8.85	0.4	21.29	262.77	24.48	41.78	20.12	122.18
4	8.98	0.4	21.66	263.56	24.56	41.99	19.90	123.14
6	9.10	0.5	22.04	264.36	24.63	42.17	19.67	124.09
8	9.22	0.5	22.43	265.20	24.70	42.32	19.43	125.06
10	9.35	+0.5	22.83	266.07	+24.76	+42.44	+19.19	126.01
12	9.48	0.6	23.24	266.96	24.82	42.54	18.95	126.96
14	9.60	0.6	23.65	267.87	24.87	42.61	18.69	127.95
16	9.72	0.6	24.07	268.81	24.91	42.66	18.43	128.92
18	9.84	0.7	24.50	269.77	24.95	42.68	18.17	129.89
20	9.97	+0.7	24.93	270.75	+24.97	+42.69	+17.90	130.86
22	10.09	0.7	25.36	271.75	24.99	42.68	17.62	131.84
24	10.21	0.7	25.80	272.76	25.00	42.64	17.34	132.83
26	10.33	0.8	26.23	273.80	25.01	42.59	17.06	133.81
28	10.45	0.8	26.67	274.86	25.00	42.52	16.76	134.80
30	10.57	+0.8	27.11	275.93	+24.98	+42.44	+16.46	135.79
July 2	10.69	+0.8	27.55	277.01	+24.96	+42.33	+16.16	136.78

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

							Mean Time of Transit of Zero Meridian.			
Date.	k	Diameter.	i	q	Q	Central Meridian.	Of Date.	Of Intermedi- ate Date.		
		"	"	"	"	"	h m	h m		
or.	1	0.985	14.81	14.02	0.22	120.69	35.37	22 11.0	22 47.1	
	3	0.982	14.68	15.48	0.27	119.64	17.78	23 23.2	23 59.4	
	5	0.979	14.53	16.90	0.31	118.78	0.14	.....	0 35.7
	7	0.975	14.38	18.28	0.36	118.05	342.44	1 12.0	1 48.4	
	9	0.971	14.21	19.61	0.41	117.44	324.70	2 24.8	3 1.3	
	11	0.967	14.04	20.90	0.46	116.89	306.90	3 37.8	4 14.4	
	13	0.963	13.86	22.13	0.51	116.42	289.04	4 51.1	5 27.8	
	15	0.959	13.67	23.32	0.56	116.01	271.13	6 4.6	6 41.4	
	17	0.955	13.48	24.45	0.60	115.65	253.15	7 18.4	7 55.3	
	19	0.951	13.29	25.54	0.65	115.33	235.12	8 32.4	9 9.5	
	21	0.947	13.10	26.58	0.69	115.06	217.04	9 46.6	10 23.8	
	23	0.944	12.90	27.56	0.73	114.81	198.89	11 1.1	11 38.5	
	25	0.940	12.70	28.50	0.77	114.59	180.69	12 15.9	12 53.3	
	27	0.936	12.51	29.39	0.80	114.40	162.44	13 30.8	14 8.4	
	29	0.932	12.31	30.23	0.84	114.23	144.13	14 46.0	15 23.7	
	ay	1	0.928	12.12	31.03	0.87	114.08	125.77	16 1.5	16 39.3
		3	0.925	11.93	31.78	0.89	113.96	107.36	17 17.1	17 55.0
		5	0.922	11.74	32.50	0.92	113.84	88.91	18 33.0	19 11.0
		7	0.919	11.56	33.16	0.94	113.75	70.40	19 49.0	20 27.1
		9	0.916	11.37	33.80	0.96	113.67	51.85	21 5.3	21 43.5
11		0.913	11.19	34.39	0.98	113.60	33.25	22 21.7	23 0.0	
13		0.910	11.02	34.94	0.99	113.54	14.60	23 38.4	.....
15		0.907	10.85	35.46	1.00	113.50	355.92	0 16.8	0 55.2	
17		0.905	10.68	35.94	1.02	113.46	337.19	1 33.7	2 12.2	
19		0.902	10.52	36.40	1.02	113.43	318.42	2 50.8	3 29.4	
	21	0.900	10.36	36.82	1.03	113.41	299.62	4 8.0	4 46.7	
	23	0.898	10.20	37.21	1.04	113.40	280.78	5 25.4	6 4.2	
	25	0.896	10.05	37.57	1.04	113.39	261.91	6 43.0	7 21.8	
	27	0.894	9.90	37.91	1.04	113.38	243.00	8 0.6	8 39.5	
	29	0.893	9.76	38.22	1.05	113.38	224.06	9 18.5	9 57.4	
	ne	31	0.891	9.62	38.50	1.04	113.38	205.09	10 36.4	11 15.5
		2	0.890	9.48	38.76	1.04	113.39	186.08	11 54.5	12 33.6
		4	0.888	9.35	39.00	1.04	113.40	167.06	13 12.8	13 51.9
		6	0.887	9.22	39.22	1.04	113.40	148.00	14 31.1	15 10.3
		8	0.886	9.10	39.42	1.04	113.41	128.92	15 49.5	16 28.8
10		0.885	8.98	39.59	1.03	113.42	109.80	17 8.1	17 47.4	
12		0.884	8.86	39.75	1.02	113.43	90.67	18 26.8	19 6.2	
14		0.884	8.74	39.89	1.02	113.44	71.51	19 45.6	20 25.0	
16		0.883	8.63	40.01	1.01	113.44	52.32	21 4.4	21 43.9	
18		0.882	8.52	40.11	1.00	113.44	33.12	22 23.4	23 2.9	
	20	0.882	8.42	40.20	0.99	113.44	13.89	23 42.4	.....
	22	0.882	8.32	40.27	0.99	113.44	354.65	0 22.0	1 1.6	
	24	0.881	8.22	40.33	0.98	113.44	335.38	1 41.2	2 20.8	
	26	0.881	8.12	40.37	0.97	113.43	316.10	3 0.4	3 40.1	
	28	0.881	8.03	40.40	0.96	113.42	296.80	4 19.8	4 59.4	
	ly	30	0.881	7.94	40.43	0.95	113.40	277.49	5 39.2	6 18.9
		2	0.881	7.85	40.44	0.94	113.38	258.15	6 58.6	7 38.4

APPARENT ORBITS OF THE SATELLITES OF MARS, AT DATE OF OPPOSITION, MARCH 14, 1918, AS SEEN IN AN INVERTING TELESCOPE.



Phobos.			Deimos.		
Date.	Position Angle of Apsis.	Apparent Distance at Apsis.	Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
Feb. 13	299.0	16.7	Feb. 13	298.4	41.8
Mar. 15	294.8	19.5	Mar. 15	294.6	48.9
Apr. 14	289.7	17.6	Apr. 14	290.0	44.2

GREENWICH MEAN TIME OF GREATEST ELONGATION.

Phobos.			Deimos.		
d	h		d	h	
Feb. 19	23.0	E.	Mar. 8	16.7	W.
21	1.8	W.	9	19.4	E.
22	4.5	E.	10	22.2	W.
23	7.3	W.	12	1.0	E.
24	10.1	E.	13	3.8	W.
25	12.9	W.	14	6.6	E.
26	15.7	E.	15	9.3	W.
27	18.4	W.	16	12.1	E.
28	21.2	E.	17	14.9	W.
Mar. 2	0.0	W.	18	17.7	E.
3	2.8	E.	19	20.5	W.
4	5.6	W.	20	23.2	E.
5	8.3	E.	22	2.0	W.
6	11.1	W.	23	4.8	E.
7	13.9	E.	24	7.6	W.
25	10.4	E.	Mar. 25	10.4	E.
26	13.1	W.	26	13.1	W.
27	15.9	E.	27	15.9	E.
28	18.7	W.	28	18.7	W.
29	21.5	E.	29	21.5	E.
31	0.2	W.	31	0.2	W.
Apr. 1	3.0	E.	Apr. 1	3.0	E.
2	5.8	W.	2	5.8	W.
3	8.6	E.	3	8.6	E.
4	11.4	W.	4	11.4	W.
5	14.2	E.	5	14.2	E.
6	16.9	W.	6	16.9	W.
7	19.7	E.	7	19.7	E.
8	22.5	W.	8	22.5	W.
10	1.3	E.	10	1.3	E.
17	17.7	E.	Feb. 17	17.7	E.
19	15.1	W.	19	15.1	W.
21	12.5	E.	21	12.5	E.
23	9.9	W.	23	9.9	W.
25	7.3	E.	25	7.3	E.
27	4.7	W.	27	4.7	W.
1	2.1	E.	Mar. 1	2.1	E.
2	23.5	W.	2	23.5	W.
4	20.9	E.	4	20.9	E.
6	18.3	W.	6	18.3	W.
8	15.6	E.	8	15.6	E.
10	13.0	W.	10	13.0	W.
12	10.4	E.	12	10.4	E.
14	7.8	W.	14	7.8	W.
16	5.2	E.	16	5.2	E.
18	2.6	W.	Mar. 18	2.6	W.
19	23.9	E.	19	23.9	E.
21	21.3	W.	21	21.3	W.
23	18.7	E.	23	18.7	E.
25	16.1	W.	25	16.1	W.
27	13.5	E.	27	13.5	E.
29	10.9	W.	29	10.9	W.
31	8.3	E.	31	8.3	E.
2	5.7	W.	Apr. 2	5.7	W.
4	3.1	E.	4	3.1	E.
6	0.5	W.	6	0.5	W.
7	21.9	E.	7	21.9	E.
9	19.3	W.	9	19.3	W.
11	16.7	E.	11	16.7	E.
13	14.1	W.	13	14.1	W.

For Phobos every seventh eastern and western elongation is given, and for Deimos every third; the intermediate ones may be found by adding multiples of the period of the satellite.

Sidereal period of Phobos, 7^h 39^m 13^s.85. Sidereal period of Deimos, 30^h 17^m 54^s.87.

HEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN NOON.

date.	Light-Time.	Stellar Magnitude.	P	$A_{\oplus} + 180^{\circ}$	D_{\oplus}	$A_{\odot} + 180^{\circ}$	D_{\odot}
	m		.	.	.	.	.
1	35.25	-2.3	348.59	286.82	+2.94	293.67	+2.81
8	35.88	2.2	348.38	286.32	2.91	294.28	2.80
15	36.60	2.2	348.24	285.98	2.88	294.90	2.78
22	37.39	2.2	348.16	285.79	2.85	295.51	2.77
29	38.24	2.1	348.16	285.78	2.82	296.12	2.76
5	39.13	-2.0	348.21	285.93	+2.79	296.74	+2.74
12	40.05	2.0	348.34	286.25	2.76	297.35	2.73
19	40.99	1.9	348.53	286.72	2.74	297.96	2.71
26	41.93	1.9	348.78	287.34	2.71	298.58	2.70
5	42.86	1.8	349.09	288.09	2.69	299.19	2.68
12	43.78	-1.8	349.45	288.96	+2.67	299.80	+2.66
19	44.66	1.7	349.86	289.96	2.65	300.41	2.65
26	45.52	1.7	350.32	291.05	2.63	301.02	2.63
2	46.33	1.7	350.82	292.23	2.61	301.63	2.61
9	47.08	1.6	351.36	293.50	2.59	302.24	2.60
16	47.79	-1.6	351.94	294.84	+2.57	302.84	+2.58
23	48.43	1.6	352.56	296.24	2.55	303.45	2.56
30	49.00	1.5	353.20	297.68	2.52	304.06	2.54
7	49.50	1.5	353.87	299.18	2.50	304.66	2.52
14	49.93	1.5	354.56	300.72	2.48	305.27	2.51
17	50.18	-1.5	1.29	315.25	+2.22	310.78	+2.32
24	49.81	1.5	2.00	316.78	2.18	311.38	2.30
31	49.36	1.5	2.69	318.26	2.15	311.98	2.28
7	48.84	1.5	3.36	319.70	2.11	312.58	2.26
14	48.26	-1.6	4.00	321.08	+2.08	313.18	+2.24
21	47.62	1.6	4.61	322.40	2.04	313.77	2.22
28	46.92	1.6	5.18	323.65	2.01	314.37	2.20
4	46.17	1.6	5.72	324.82	1.98	314.97	2.17
11	45.37	1.7	6.21	325.90	1.94	315.56	2.15
18	44.53	-1.7	6.65	326.88	+1.91	316.16	+2.13
25	43.67	1.8	7.04	327.75	1.88	316.75	2.10
2	42.79	1.8	7.38	328.51	1.86	317.34	2.08
9	41.89	1.9	7.66	329.13	1.83	317.94	2.06
16	41.01	1.9	7.87	329.61	1.81	318.53	2.03
23	40.12	-2.0	8.01	329.94	+1.79	319.12	+2.01
30	39.26	2.0	8.09	330.11	1.78	319.71	1.98
6	38.45	2.0	8.10	330.13	1.76	320.30	1.96
13	37.68	2.1	8.03	329.96	1.75	320.90	1.94
20	36.98	2.1	7.89	329.66	1.75	321.49	1.91
27	36.36	-2.2	7.69	329.20	+1.74	322.08	+1.89
4	35.84	2.2	7.42	328.59	1.74	322.66	1.86
11	35.42	2.2	7.09	327.85	1.74	323.25	1.84
18	35.11	2.2	6.72	327.02	1.74	323.84	1.81
25	34.93	2.2	6.32	326.12	1.75	324.42	1.79
32	34.87	-2.3	5.89	325.18	+1.75	325.01	+1.76

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN NOON.

Date.		Equatorial Diameter.	Excess of Equat. Diameter over Polar.	i	f	Q	Central Meridian.		Correction for Phase.
							System I.	System II.	
		"	"	"	"	"	"	"	"
Jan.	1	47.24	2.86	6.83	0.17	77.73	15.16	270.10	-0.20
	8	46.41	2.81	7.95	0.22	77.80	40.57	242.11	0.28
	15	45.49	2.75	8.91	0.28	77.87	65.78	213.91	0.35
	22	44.54	2.69	9.71	0.32	77.95	90.78	185.50	0.41
	29	43.55	2.64	10.33	0.35	78.07	115.58	156.90	0.46
Feb.	5	42.56	2.58	10.79	0.38	78.22	140.18	128.09	-0.51
	12	41.58	2.52	11.09	0.39	78.42	164.61	99.11	0.54
	19	40.63	2.46	11.23	0.39	78.67	188.86	69.96	0.55
	26	39.71	2.40	11.22	0.38	78.96	212.98	40.67	0.55
Mar.	5	38.85	2.35	11.08	0.36	79.29	236.96	11.24	0.53
	12	38.04	2.30	10.82	0.34	79.68	260.82	341.70	-0.51
	19	37.28	2.26	10.44	0.31	80.10	284.59	312.06	0.47
	26	36.58	2.22	9.96	0.27	80.57	308.27	282.35	0.43
Apr.	2	35.94	2.18	9.38	0.24	81.08	331.90	252.56	0.38
	9	35.37	2.14	8.73	0.20	81.63	355.47	222.73	0.33
	16	34.85	2.11	8.00	0.17	82.21	19.00	192.86	-0.28
	23	34.39	2.08	7.21	0.14	82.84	42.51	162.96	0.23
	30	33.99	2.06	6.36	0.10	83.51	66.01	133.06	0.18
May	7	33.64	2.04	5.47	0.08	84.24	89.51	103.15	0.13
	14	33.35	2.02	4.54	0.05	85.01	113.01	73.24	0.09
	
July	17	33.19	2.01	4.47	0.05	269.81	123.93	315.84	+0.09
	24	33.43	2.02	5.39	0.07	270.62	147.93	286.43	0.13
	31	33.74	2.04	6.27	0.10	271.36	172.02	257.11	0.17
Aug.	7	34.09	2.06	7.11	0.13	272.03	196.20	227.87	0.22
	14	34.50	2.09	7.90	0.17	272.68	220.47	198.73	+0.27
	21	34.97	2.12	8.62	0.20	273.30	244.84	169.69	0.32
	28	35.49	2.15	9.28	0.23	273.88	269.32	140.75	0.37
Sept.	4	36.07	2.19	9.85	0.27	274.40	293.91	111.92	0.42
	11	36.70	2.23	10.33	0.30	274.88	318.61	83.22	0.46
	18	37.39	2.27	10.72	0.33	275.32	343.44	54.63	+0.50
	25	38.13	2.31	11.00	0.35	275.71	8.39	26.17	0.53
Oct.	2	38.92	2.36	11.16	0.37	276.04	33.48	357.84	0.54
	9	39.75	2.41	11.19	0.38	276.32	58.70	329.65	0.54
	16	40.61	2.46	11.07	0.38	276.53	84.07	301.59	0.53
	23	41.51	2.52	10.81	0.37	276.68	109.57	273.69	+0.51
	30	42.41	2.57	10.40	0.35	276.77	135.22	245.92	0.47
Nov.	6	43.31	2.63	9.82	0.32	276.78	161.01	218.29	0.42
	13	44.19	2.68	9.08	0.28	276.72	186.92	190.80	0.36
	20	45.03	2.73	8.18	0.23	276.60	212.96	163.42	0.29
	27	45.79	2.78	7.12	0.17	276.40	239.10	136.15	+0.22
Dec.	4	46.46	2.82	5.92	0.12	276.15	265.34	108.97	0.15
	11	47.02	2.85	4.60	0.08	275.83	291.63	81.85	0.09
	18	47.43	2.87	3.18	0.04	275.44	317.94	54.76	0.04
	25	47.68	2.89	1.69	0.01	274.93	344.26	27.66	+0.01
	32	47.76	2.89	0.16	0.00	272.42	10.54	0.52	0.00

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER,
SYSTEM I.

GREENWICH MEAN TIME.

Transit of Zero Meridian.	Interval between Successive Transits.	Transit of Zero Meridian.	Interval between Successive Transits.	Transit of Zero Meridian.	Interval between Successive Transits.
d h m	h m	d h m	h m	d h m	h m
1 9 25.96	9 50.50	Apr. 18 0 42.61	9 50.67	Sept. 18 20 7.42	9 50.53
3 10 38.41		20 1 55.95		20 21 20.08	
5 11 50.89		22 3 9.28		22 22 32.73	
7 13 3.39		24 4 22.62		24 23 45.37	
9 14 15.93		26 5 35.96		27 0 57.98	
11 15 28.50	9 50.53	28 6 49.30	9 50.67	29 2 10.58	9 50.51
13 16 41.09		30 8 2.65		1 3 23.16	
15 17 53.71		2 9 15.99		3 4 35.73	
17 19 6.36		4 10 29.34		5 5 48.28	
19 20 19.04		6 11 42.69		7 7 0.81	
21 21 31.75	9 50.55	8 12 56.03	9 50.67	9 8 13.32	9 50.49
23 22 44.49		10 14 9.37		11 9 25.81	
25 23 57.25		12 15 22.71		13 10 38.29	
28 1 10.03		14 16 36.06		15 11 50.74	
30 2 22.85		16 17 49.40		17 13 3.18	
1 3 35.69	9 50.57	18 19 2.74	9 50.67	19 14 15.60	9 50.48
3 4 48.55		20 20 16.07		21 15 28.01	
5 6 1.44		22 21 29.41		23 16 40.39	
7 7 14.35		24 22 42.74		25 17 52.76	
9 8 27.28		26 23 56.07		27 19 5.11	
11 9 40.24	9 50.60	28 24 9.40		29 20 17.44	9 50.46
13 10 53.22		17 6 27.16	9 50.62	31 21 29.75	
15 12 6.22		19 7 40.28		2 22 42.05	
17 13 19.24		21 8 53.39		4 23 54.33	
19 14 32.27		23 10 6.48		7 1 6.60	
21 15 45.33	9 50.62	25 11 19.56	9 50.61	9 2 18.84	9 50.44
23 16 58.40		27 12 32.82		11 3 31.07	
25 18 11.49		29 13 45.68		13 4 43.28	
27 19 24.59		31 14 58.72		15 5 55.47	
1 20 37.72		2 16 11.75		17 7 7.65	
3 21 50.86	9 50.63	4 17 24.76	9 50.60	19 8 19.82	9 50.43
5 23 4.01		6 18 37.76		21 9 31.97	
8 0 17.18		8 19 50.75		23 10 44.10	
10 1 30.36		10 21 3.73		25 11 56.23	
12 2 43.56		12 22 16.69		27 13 8.33	
14 3 56.76	9 50.64	14 23 29.63	9 50.58	29 14 20.43	9 50.42
16 5 9.98		17 0 42.56		1 15 32.52	
18 6 23.21		19 1 55.48		3 16 44.59	
20 7 36.45		21 3 8.38		5 17 56.65	
22 8 49.70		23 4 21.27		7 19 8.71	
24 10 2.96	9 50.65	25 5 34.14	9 50.57	9 20 20.76	9 50.41
26 11 16.23		27 6 47.00		11 21 32.79	
28 12 29.51		29 7 59.85		13 22 44.84	
30 13 42.79		31 9 12.68		15 23 56.87	
1 14 56.08		2 10 25.49		18 1 8.89	
3 16 9.38	9 50.66	4 11 38.29	9 50.55	20 2 20.93	9 50.40
5 17 22.68		6 12 51.07		22 3 32.96	
7 18 35.99		8 14 3.83		24 4 44.98	
9 19 49.31		10 15 16.58		26 5 57.01	
11 21 2.63		12 16 29.32		28 7 9.05	
13 22 15.95	9 50.67	14 17 42.03	9 50.54	30 8 21.09	9 50.41
15 23 29.28		16 18 54.73		32 9 33.13	

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER,
SYSTEM II.

GREENWICH MEAN TIME.

Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.	
				h	m					h	m					h	m
Jan.	d	h	m	9	55.67	Apr.	d	h	m	9	55.85	Sept.	d	h	m	9	55.
	1	2	29.09				18	16	12.18				19	4	15.92		
	3	4	7.42				20	17	51.41				21	5	54.47		
	5	5	45.78				22	19	30.65				23	7	33.01		
	7	7	24.17				24	21	9.89				25	9	11.53		
	9	9	2.58	26	22	49.13	27	10	50.03								
	11	10	41.03	9	55.70	May	29	0	28.37	9	55.85	Oct.	29	12	28.52	9	55.
	13	12	19.51				1	2	7.61				1	14	6.99		
	15	13	58.02				3	3	46.86				3	15	45.44		
	17	15	36.55				5	5	26.10				5	17	23.87		
19	17	15.12	7				7	5.35	7				19	2.28			
21	18	53.71	9	55.73		9	8	44.59	9	55.85		9	20	40.68	9	55.	
23	20	32.33			11	10	23.83	11			22	19.05					
25	22	10.98			13	12	3.08	13			23	57.41					
27	23	49.65			15	13	42.32	16			1	35.74					
30	1	28.36			17	15	21.56	18			3	14.07					
Feb.	1	3	7.09	9	55.75		19	17	0.80	9	55.85		20	4	52.38	9	55.
	3	4	45.84			21	18	40.03	22			6	30.66				
	5	6	24.62			23	20	19.26	24			8	8.93				
	7	8	3.42			25	21	58.49	26			9	47.17				
	9	9	42.24			27	23	37.72	28			11	25.40				
	11	11	21.09	9	55.77	July	17	1	12.95	9	55.80	Nov.	30	13	3.61	9	55.
	13	12	59.96				19	2	51.96				1	14	41.60		
	15	14	38.85				21	4	30.97				3	16	19.97		
	17	16	17.76				23	6	9.96				5	17	58.13		
	19	17	56.69				25	7	48.94				7	19	36.27		
21	19	35.64	9	55.79		27	9	27.90	9	55.79		9	21	14.89	9	55.	
23	21	14.61			29	11	6.85	11			22	52.50					
25	22	53.60			31	12	45.79	14			0	30.59					
28	0	32.60			2	14	24.71	16			2	8.65					
Mar.	2	2			11.62	9	55.81	Aug.			4	16	3.63	9			55.78		18	3	46.71	9	55.
4	3	50.66	6	17	42.52				20	5	24.75						
6	5	29.71	8	19	21.41				22	7	2.78						
8	7	8.77	10	21	0.28				24	8	40.79						
10	8	47.85	12	22	39.13				26	10	18.79						
12	10	26.94	9	55.82		15	0	17.97	9	55.76	Dec.	28	11	56.77	9	55.	
14	12	6.04			17	1	56.80	30				13	34.74				
16	13	45.16			19	3	35.61	2				15	12.70				
18	15	24.29			21	5	14.41	4				16	50.65				
20	17	3.43			23	6	53.19	6				18	28.59				
22	18	42.58	9	55.83		25	8	31.96	9	55.75		8	20	6.52	9	55.	
24	20	21.74			27	10	10.71	10			21	44.44					
26	22	0.90			29	11	49.45	12			23	22.35					
28	23	40.08			31	13	28.17	15			1	0.27					
31	1	19.27			2	15	6.87	17			2	38.18					
Apr.	2	2	58.45	9	55.84	Sept.				9	55.73		19	4	16.08	9	55.
4	4	37.65	4				16	45.56	21			5	53.99				
6	6	16.85	6				18	24.23	23			7	31.89				
8	7	56.06	8				20	2.89	25			9	9.80				
10	9	35.28	10				21	41.53	27			10	47.71				
12	11	14.50	9	55.85		12	23	20.15	9	55.71		29	12	25.63	9	55.	
14	12	53.72			15	0	58.75	31			14	3.55					
16	14	32.95			17	2	37.34	33			15	41.47					

SATELLITE V.

GREENWICH MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

Jan.	d	h	E.	Oct.	d	h	E.	Jan.	d	h	W.	Oct.	d	h	W.
	1	15.3	E.		11	16.0	E.		1	21.3	W.		11	22.0	W.
	11	14.5	E.		21	15.1	E.		11	20.4	W.		21	21.1	W.
	21	13.6	E.		31	14.3	E.		21	19.6	W.		31	20.2	W.
	31	12.7	E.	Nov.	10	13.4	E.		31	18.7	W.	Nov.	10	19.4	W.
Feb.	10	11.9	E.		20	12.4	E.	Feb.	10	17.9	W.		20	18.4	W.
	20	11.1	E.		30	11.5	E.		20	17.0	W.		30	17.5	W.
Mar.	2	10.2	E.	Dec.	10	10.6	E.	Mar.	2	16.2	W.	Dec.	10	16.6	W.
					20	9.7	E.						20	15.7	W.
Oct.	1	16.9	E.		30	8.8	E.	Oct.	1	22.9	W.		30	14.8	W.

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

Jan.	d	h	m	Mar.	d	h	m	July	d	h	m	Oct.	d	h	m	
	1	12	21.9		22	3	40.1		25	21	27.0		13	13	23.0	
	3	6	48.6		23	22	9.9		27	15	57.0		15	7	51.1	
	5	1	15.5		25	16	39.6		29	10	27.0		17	2	19.2	
	6	19	42.3		27	11	9.5		31	4	56.9		18	20	47.1	
	8	14	9.4		29	5	39.4	Aug.	1	23	26.9		20	15	15.1	
	10	8	36.5		31	0	9.3		3	17	56.8		22	9	42.9	
	12	3	3.7	Apr.	1	18	39.2		5	12	26.7		24	4	10.7	
	13	21	30.9		3	13	9.2		7	6	56.6		25	22	38.4	
	15	15	58.3		5	7	39.2		9	1	26.4		27	17	6.1	
	17	10	25.7		7	2	9.3		10	19	56.2		29	11	33.6	
	19	4	53.2		8	20	39.3		12	14	26.0		31	6	1.2	
	20	23	20.7		10	15	9.4		14	8	55.8	Nov.	2	0	28.6	
	22	17	48.4		12	9	39.5		16	3	25.5		3	18	56.0	
	24	12	16.1		14	4	9.7		17	21	55.2		5	13	23.2	
	26	6	44.0		15	22	39.8		19	16	24.8		7	7	50.5	
	28	1	11.8		17	17	10.0		21	10	54.5		9	2	17.6	
	29	19	39.8		19	11	40.2		23	5	24.0		10	20	44.7	
	31	14	7.8		21	6	10.5		24	23	53.6		12	15	11.7	
Feb.	2	8	36.0		23	0	40.7		26	18	23.1		14	9	38.7	
	4	3	4.1		24	19	11.0		28	12	52.6		16	4	5.6	
	5	21	32.4		26	13	41.2		30	7	22.1		17	22	32.4	
	7	16	0.8		28	8	11.5	Sept.	1	1	51.5		19	16	59.1	
	9	10	29.2		30	2	41.8		2	20	20.8		21	11	25.9	
	11	4	57.7		1	21	12.1		4	14	50.2		23	5	52.5	
	12	23	26.3	May	3	15	42.4		6	9	19.4		25	0	19.1	
	14	17	54.9		5	10	12.8		8	3	48.7		26	18	45.6	
	16	12	23.6		7	4	43.1		9	22	17.9		28	13	12.1	
	18	6	52.3		8	23	13.5		11	16	47.0		30	7	38.4	
	20	1	21.2		10	17	43.9		13	11	16.0	Dec.	2	2	4.8	
	21	19	50.1		12	12	14.3		15	5	45.2		3	20	31.0	
	23	14	19.1		14	6	44.6		17	0	14.2		5	14	57.3	
	25	8	48.1		16	1	15.0		18	18	43.2		7	9	23.5	
	27	3	17.2		17	19	45.4		20	13	12.1		9	3	49.7	
	28	21	46.3		19	14	15.8		22	7	41.0		10	22	15.7	
Mar.	2	16	15.6		..	..	..		24	2	9.8		12	16	41.9
	4	10	44.8		..	..	..		25	20	38.6		14	11	7.9
	6	5	14.1		..	..	..		27	15	7.2		16	5	33.9
	7	23	43.4	July	11	17	26.1		29	9	35.9		17	23	59.9	
	9	18	12.9		13	11	56.2		Oct.	1	4	4.5		19	18	25.9
	11	12	42.3		15	6	26.4		2	22	33.0		21	12	51.8	
	13	7	11.9		17	0	56.6		4	17	1.5		23	7	17.8	
	15	1	41.4		18	19	26.7		6	11	29.9		25	1	43.6	
	16	20	11.0		20	13	56.8		8	5	58.3		26	20	9.6	
	18	14	40.6		22	8	26.8		10	0	26.6		28	14	35.5	
20	9	10.4		24	2	56.9		11	18	54.8		30	9	1.4		

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

n.	d	h	m	Mar.	d	h	m	July	d	h	m	Oct.	d	h	m
a.	2	10	34.8	25	3	48.3		24	4	4.2		13	23	22.4	
	5	23	44.5	28	17	10.5		27	17	28.9		17	12	38.9	
	9	12	54.9	1	6	33.2		31	6	54.3		21	1	54.4	
	13	2	5.8	4	19	56.0		3	20	18.5		24	15	9.6	
	16	15	17.4	8	9	19.4		7	9	43.5		28	4	24.0	
	20	4	29.5	11	22	42.8		10	23	7.3		31	17	37.9	
	23	17	42.4	15	12	6.8		14	12	31.8		4	6	51.1	
	27	6	55.8	19	1	30.8		18	1	55.1		7	20	3.8	
	30	20	9.9	22	14	55.3		21	15	18.9		11	9	15.8	
b.	3	9	24.6	26	4	19.7		25	4	41.7		14	22	27.3	
	6	22	39.9	29	17	44.7		28	18	4.8		18	11	38.0	
	10	11	55.8	3	7	9.5		1	7	26.9		22	0	48.3	
	14	1	12.3	6	20	34.9		4	20	49.3		25	13	58.0	
	17	14	29.4	10	10	0.0		8	10	10.7		29	3	7.2	
	21	3	47.1	18	23	25.8		11	23	32.3		2	16	15.9	
	24	17	5.3	17	12	51.1		15	12	52.9		6	5	24.1	
	28	6	24.0	..	..	..		19	2	13.6		9	18	31.9	
sr.	3	19	43.3	..	..	..		22	15	33.3		13	7	39.4	
	9	9	3.0	..	..	..		26	4	53.0		16	20	46.5	
	10	22	23.2	..	..	..		29	18	11.7		20	9	53.4	
	14	11	43.8	July	13	11	47.3	Oct.	3	7	30.4	23	23	0.1	
	18	1	4.9	17	1	13.4		6	20	48.2		27	12	6.6	
	21	14	26.4	20	14	38.4		10	10	5.8		31	1	13.0	

SATELLITE III.

n.	d	h	m	Apr.	d	h	m	July	d	h	m	Oct.	d	h	m
a.	6	2	27.6	2	1	55.5		18	20	45.1		12	23	38.8	
	13	5	59.8	9	6	16.1		26	1	12.2		20	3	32.3	
	20	9	37.1	16	10	39.4		2	5	37.2		27	7	21.1	
	27	13	18.8	23	15	3.8		9	10	0.6		3	11	5.7	
b.	3	17	5.5	30	19	29.8		16	14	21.8		10	14	44.7	
	10	20	57.4	7	23	56.3		23	18	41.1		17	18	18.8	
	18	0	54.2	15	4	23.9		30	22	58.6		24	21	48.0	
	25	4	56.1	..	..	..		7	3	13.7		2	1	13.0	
sr.	4	9	1.5	..	..	..		14	7	26.5		9	4	34.9	
	11	13	10.7	..	..	..		21	11	35.4		16	7	53.7	
	18	17	22.6	..	..	..		28	15	40.6		23	11	10.9	
	25	21	37.6	July	11	16	17.6	Oct.	5	19	41.7	30	14	26.1	

SATELLITE IV.

n.	d	h	m	Apr.	d	h	m	July	d	h	m	Oct.	d	h	m
a.	10	3	34.1	3	21	35.8		30	22	18.7		22	22	1.9	
	26	19	39.1	20	17	45.9		16	18	37.4		8	14	42.1	
b.	12	12	48.6	7	14	18.1		2	14	29.9		25	6	21.3	
sr.	1	6	56.7	..	..	..		19	9	47.2		11	21	5.6	
	18	1	55.8	July	14	1	41.5	Oct.	6	4	21.5	28	11	14.7	

DIFFERENTIAL COORDINATES OF SATELLITE VI.

FOR GREENWICH MEAN NOON.

Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$
	m s	'		m s	'		m s	'
Jan. 0	-1 44	+19.0	Apr. 14	+0 9	-24.7	Sept. 21	-0 34	+15.1
2	1 58	17.7	16	0 15	24.5	23	0 47	14.5
4	2 10	16.3	18	0 22	24.2	25	0 59	13.8
6	2 22	14.8	20	0 28	24.0	27	1 11	13.0
8	2 34	13.3	22	0 35	23.7	29	1 23	12.2
10	-2 44	+11.8	24	+0 41	-23.3	Oct. 1	-1 34	+11.3
12	2 53	10.2	26	0 47	23.0	3	1 46	10.4
14	3 1	8.5	28	0 53	22.6	5	1 57	9.4
16	3 8	6.9	30	0 59	22.2	7	2 8	8.4
18	3 14	5.2	May 2	1 5	21.8	9	2 19	7.3
20	-3 19	+ 3.6	4	+1 11	-21.4	11	-2 29	+ 6.2
22	3 23	1.9	6	1 16	20.9	13	2 39	5.0
24	3 27	+ 0.3	8	1 22	20.4	15	2 48	3.8
26	3 29	- 1.3	10	1 27	20.0	17	2 57	2.6
28	3 30	2.9	12	1 32	19.4	19	3 6	1.4
30	-3 31	- 4.4	14	+1 38	-18.9	21	-3 14	+ 0.2
Feb. 1	3 31	5.9	16	+1 43	-18.4	23	3 22	- 1.0
3	3 30	7.3	..	..	...	25	3 29	2.3
5	3 28	8.7	..	..	...	27	3 35	3.5
7	3 26	10.0	July 17	+3 8	+ 4.0	29	3 41	4.8
9	-3 23	-11.2	19	+3 8	+ 4.8	Nov. 31	-3 47	- 6.0
11	3 20	12.4	21	3 7	5.6	2	3 52	7.2
13	3 16	13.6	23	3 6	6.4	4	3 56	8.5
15	3 11	14.7	25	3 4	7.2	6	4 0	9.7
17	3 6	15.7	27	3 3	8.0	8	4 2	10.9
19	-3 1	-16.6	29	+3 1	+ 8.8	10	-4 5	-12.2
21	2 56	17.5	31	2 58	9.6	12	4 7	13.4
23	2 50	18.3	Aug. 2	2 55	10.3	14	4 8	14.6
25	2 44	19.1	4	2 52	11.0	16	4 8	15.7
27	2 37	19.8	6	2 48	11.8	18	4 8	16.9
Mar. 1	-2 31	-20.5	8	+2 44	+12.4	20	-4 7	-18.0
3	2 24	21.1	10	2 40	13.1	22	4 6	19.2
5	2 17	21.6	12	2 35	13.7	24	4 4	20.3
7	2 10	22.2	14	2 29	14.3	26	4 1	21.3
9	2 2	22.6	16	2 23	14.8	28	3 57	22.4
11	-1 55	-23.1	18	+2 17	+15.4	Dec. 30	-3 53	-23.4
13	1 48	23.5	20	2 10	15.8	2	3 48	24.4
15	1 40	23.8	22	2 2	16.2	4	3 43	25.3
17	1 32	24.1	24	1 54	16.6	6	3 37	26.2
19	1 25	24.4	26	1 46	16.9	8	3 31	27.1
21	-1 18	-24.6	28	+1 37	+17.2	10	-3 23	-27.9
23	1 10	24.8	30	1 28	17.4	12	3 16	28.7
25	1 3	25.0	Sept. 1	1 19	17.5	14	3 7	29.4
27	0 55	25.1	3	1 9	17.6	16	2 59	30.0
29	0 48	25.2	5	0 58	17.6	18	2 49	30.6
31	-0 40	-25.2	7	+0 48	+17.5	20	-2 40	-31.2
Apr. 2	0 36	25.3	9	0 36	17.4	22	2 29	31.6
4	0 26	25.2	11	0 25	17.2	24	2 19	32.0
6	0 19	25.2	13	0 14	16.9	26	2 8	32.3
8	0 12	25.1	15	+0 2	16.6	28	1 57	32.5
10	-0 5	-25.0	17	-0 10	+16.2	30	-1 45	-32.6
12	+0 2	-24.8	19	-0 22	+15.7	32	-1 34	-32.7

DIFFERENTIAL COORDINATES OF SATELLITE VII.

FOR GREENWICH MEAN NOON.

Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$
	m s	'		m s	'		m s	'
0	+0 28	- 9.0	Apr. 14	-0 21	+11.6	Sept. 21	-1 32	- 8.1
2	0 42	9.6	16	0 28	12.2	23	1 22	9.3
4	0 55	10.1	18	0 35	12.8	25	1 11	10.4
6	1 9	10.6	20	0 41	13.4	27	1 1	11.6
8	1 21	11.1	22	0 48	13.9	29	0 50	12.7
10	+1 34	-11.5	24	-0 54	+14.5	Oct. 1	-0 39	-13.8
12	1 45	11.8	26	1 0	15.0	3	0 27	14.8
14	1 56	12.1	28	1 6	15.5	5	0 15	15.8
16	2 6	12.4	30	1 13	16.0	7	-0 3	16.7
18	2 16	12.6	May 2	1 19	16.5	9	+0 9	17.6
20	+2 24	-12.7	4	-1 24	+17.0	11	+0 22	-18.4
22	2 32	12.8	6	1 30	17.5	13	0 34	19.1
24	2 40	12.8	8	1 36	17.9	15	0 47	19.8
26	2 46	12.8	10	1 41	18.4	17	0 59	20.4
28	2 51	12.7	12	1 46	18.8	19	1 12	20.9
30	+2 56	-12.6	14	-1 52	+19.2	21	+1 24	-21.3
1	2 59	12.4	16	-1 57	+19.6	23	1 37	21.6
3	3 2	12.1	..	. ..	...	25	1 49	21.8
5	3 4	11.8	..	. ..	...	27	2 1	21.9
7	3 5	11.5	July 17	-3 27	+19.9	29	2 12	21.9
9	+3 5	-11.0	19	-3 28	+19.6	31	+2 23	-21.8
11	3 4	10.6	21	3 28	19.2	Nov. 2	2 34	21.5
13	3 2	10.1	23	3 28	18.8	4	2 44	21.2
15	3 0	9.5	25	3 29	18.4	6	2 53	20.7
17	2 57	8.9	27	3 29	17.9	8	3 2	20.1
19	+2 53	- 8.3	29	-3 28	+17.4	10	+3 10	-19.4
21	2 49	7.6	31	3 28	16.9	12	3 17	18.6
23	2 44	6.9	Aug. 2	3 28	16.3	14	3 23	17.7
25	2 38	6.2	4	3 27	15.7	16	3 29	16.7
27	2 32	5.5	6	3 26	15.1	18	3 34	15.6
1	+2 26	- 4.7	8	-3 25	+14.4	20	+3 38	-14.4
3	2 19	3.9	10	3 23	13.7	22	3 41	13.1
5	2 12	3.1	12	3 22	13.0	24	3 43	11.8
7	2 4	2.3	14	3 20	12.2	26	3 45	10.4
9	1 57	1.5	16	3 17	11.4	28	3 45	8.9
11	+1 49	- 0.7	18	-3 15	+10.6	30	+3 45	- 7.4
13	1 41	+ 0.1	20	3 12	9.7	Dec. 2	3 44	5.9
15	1 33	0.9	22	3 9	8.7	4	3 42	4.3
17	1 25	1.7	24	3 5	7.8	6	3 39	2.7
19	1 17	2.5	26	3 1	6.8	8	3 36	- 1.1
21	+1 9	+ 3.3	28	-2 57	+ 5.8	10	+3 31	+ 0.5
23	1 1	4.1	30	2 52	4.7	12	3 26	2.1
25	0 53	4.8	Sept. 1	2 47	3.6	14	3 21	3.7
27	0 46	5.6	3	2 41	2.5	16	3 15	5.3
29	0 38	6.3	5	2 35	1.4	18	3 8	6.9
31	+0 30	+ 7.0	7	-2 29	+ 0.2	20	+3 0	+ 8.4
2	0 22	7.7	9	2 22	- 1.0	22	2 52	10.0
4	0 15	8.4	11	2 15	2.2	24	2 44	11.5
6	+0 7	9.1	13	2 7	3.3	26	2 35	12.9
8	0 0	9.8	15	1 59	4.5	28	2 25	14.4
10	-0 7	+10.4	17	-1 50	- 5.7	30	+2 16	+15.8
12	-0 14	+11.0	19	-1 41	- 6.9	32	+2 5	+17.2

GREENWICH MEAN TIME.

JANUARY.

d h m s		d h m s		d h m s		d h m s	
1 11 16	I.*Oc. D.	9 17 21	III.*Tr. E.	18 8 49	II. Tr. I.	27 4 1	I. Sh
14 17 10	I.*Ec. R.	19 11	III.*Sh. I.	9 47	I. Sh. E.	5 0	I. Tr
		21 21	III. Sh. E.	11 3	II.*Sh. I.	5 40	II. Oc
2 8 30	I. Tr. I.			11 20	II.*Tr. E.	6 11	I. Sh
9 19	I. Sh. I.	10 7 31	I. Oc. D.	13 34	II.*Sh. E.	10 34 10	II. E
9 21	II. Oc. D.	10 41 41	I.*Ec. R.			12 15	III.*O
10 39	I.*Tr. E.			19 3 47	I. Oc. D.	14 22	III.*O
11 29	I.*Sh. E.	11 4 44	I. Tr. I.	7 6 23	I. Ec. R.	17 4 37	III.*E
11 54	III.*Tr. I.	5 42	I. Sh. I.			19 19 14	III. E
13 29 1	II.*Ec. R.	6 23	II. Tr. I.	20 1 0	I. Tr. I.		
13 50	III.*Tr. E.	6 53	I. Tr. E.	2 6	I. Sh. I.	28 0 6	I. O
15 11	III.*Sh. I.	7 52	I. Sh. E.	3 10	I. Tr. E.	3 31 1	I. E
17 20	III.*Sh. E.	8 25	II. Sh. I.	3 14	II. Oc. D.	21 19	I. T
		8 54	II. Tr. E.	4 16	I. Sh. E.	22 30	I. S
3 5 43	I. Oc. D.	10 56	II.*Sh. E.	7 58 10	II. Ec. R.	23 28	I. T
8 46 3	I. Ec. R.			8 35	III. Oc. D.		
		12 1 58	I. Oc. D.	10 39	III. Oc. R.	29 0 33	II. T
4 2 56	I. Tr. I.	5 10 40	I. Ec. R.	13 4 13	III.*Ec. D.	0 40	I. S
3 47	I. Sh. I.	23 11	I. Tr. I.	15 17 32	III.*Ec. R.	3 1	II. S
4 0	II. Tr. I.			22 15	I. Oc. D.	3 4	II. T
5 6	I. Tr. E.	13 0 11	I. Sh. I.			5 32	II. S
5 46	II. Sh. I.	0 51	II. Oc. D.	21 1 35 15	I. Ec. R.	18 34	I.*O
5 57	I. Sh. E.	1 21	I. Tr. E.	19 28	I.*Tr. I.	22 0 0	I. E
6 31	II. Tr. E.	2 21	I. Sh. E.	20 35	I. Sh. I.		
8 17	II. Sh. E.	4 59	III. Oc. D.	21 37	I. Tr. E.	30 15 46	I.*T
		5 22 21	II. Ec. R.	22 3	II. Tr. I.	16 59	I.*S
5 0 10	I. Oc. D.	7 1	III. Oc. R.	22 45	I. Sh. E.	17 56	I.*T
3 15 0	I. Ec. R.	9 3 12	III. Ec. D.			18 54	II.*O
21 23	I. Tr. I.	11 15 14	III.*Ec. D.	22 0 23	II. Sh. I.	19 9	I. S
22 16	I. Sh. I.	20 25	I. Oc. D.	0 34	II. Tr. E.	23 52 12	II. E
22 30	II. Oc. D.	23 39 31	I. Ec. R.	2 54	II. Sh. E.		
23 33	I. Tr. E.			16 43	I.*Oc. D.	31 2 16	III. T
		14 17 38	I.*Tr. I.	20 4 14	I. Ec. R.	4 22	III. T
6 0 26	I. Sh. E.	18 39	I.*Sh. I.			7 13	III. S
1 28	III. Oc. D.	19 36	II.*Tr. I.	23 13 55	I.*Tr. I.	9 26	III. S
2 46 42	II. Ec. R.	19 48	I.*Tr. E.	15 4	I.*Sh. I.	13 2	I.*O
3 27	III. Oc. R.	20 49	I. Sh. E.	16 5	I.*Tr. E.	16 28 55	I.*E
5 2 18	III. Ec. D.	21 44	II. Sh. I.	16 27	II.*Oc. D.		
7 13 2	III. Ec. R.	22 7	II. Tr. E.	17 14	I.*Sh. E.		
18 37	I.*Oc. D.			21 16 8	II. Ec. R.		
21 43 50	I. Ec. R.	15 0 16	II. Sh. E.	22 32	III. Tr. I.		
		14 53	I.*Oc. D.				
7 15 50	I.*Tr. I.	18 8 29	I.*Ec. R.	24 0 36	III. Tr. E.		
16 45	I.*Sh. I.			3 12	III. Sh. I.		
17 13	II.*Tr. I.	16 12 6	I.*Tr. I.	5 24	III. Sh. E.		
18 0	I.*Tr. E.	13 9	I.*Sh. I.	11 10	I.*Oc. D.		
18 55	I.*Sh. E.	14 2	II.*Oc. D.	14 33 8	I.*Ec. R.		
19 6	II.*Sh. I.	14 15	I.*Tr. E.				
19 43	II.*Tr. E.	15 19	I.*Sh. E.	25 8 23	I. Tr. I.		
21 37	II. Sh. E.	18 40 16	II.*Ec. R.	9 32	I. Sh. I.		
		18 55	III.*Tr. I.	10 33	I. Tr. E.		
8 13 4	I.*Oc. D.	20 56	III. Tr. E.	11 17	II.*Tr. I.		
16 12 48	I.*Ec. R.	23 12	III. Sh. I.	11 43	I.*Sh. E.		
				13 41	II.*Sh. I.		
9 10 17	I. Tr. I.	17 1 22	III. Sh. E.	13 49	II.*Tr. E.		
11 14	I.*Sh. I.	9 20	I. Oc. D.	16 13	II.*Sh. E.		
11 40	II.*Oc. D.	12 37 23	I.*Ec. R.				
12 26	I.*Tr. E.			26 5 38	I. Oc. D.		
13 24	I.*Sh. E.	18 6 33	I. Tr. I.	9 2 8	I. Ec. R.		
15 22	III.*Tr. I.	7 37	I. Sh. I.				
16 4 32	II.*Ec. R.	8 42	I. Tr. E.	27 2 51	I. Tr. I.		

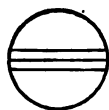
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

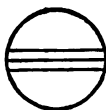
JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

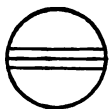


*
r

III.

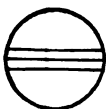


*
d *
r



*
r

IV. No Eclipse.



Configurations at 15^h 30^m for an Inverting Telescope.

West.

East.

·2 ○⁴₁ 3·

4· 1· 3· ○ ·2

4· 3· ○ ·1*

4· ·3 2·1 ○

4· ·3 ○³₃ 1·

·4 ·1 ○ ·3·2

·4 1○² ·3

·4 2· ○ 3· ·1●

·4 ○ ·2●

3· ○ ·1₄ 2·

·3 1·² ○ ·4

·3 ○ 1· ·4

·1 ○ ·3·2 ·4

○²₁ ·3 4·

2· ○ 3· 4· ·1●

1· ○² 4· ·2●

3· ○ ·1⁴₂

·3 1·2·4· ○

4· ·3·2 ○ 1·

4· ·1 ○ ·3·2

4· ○ 1·² ·3

4· 2· ·1○ 3·

·4 ·○23·

·4 3· ○ ·1 2·

3· ·4 1·2· ○

·3·2 ·4○ ·1

·1 ○ ·3 ·2·4

○ 1·2· ·3 ·4

2· ·1○ 3· ·4

·2¹○ 3· ·4

3· ○ ·2 4· ·1●

GREENWICH MEAN TIME.

FEBRUARY.

d h m s		d h m s		d h m s		d h m s	
1 10 15	I. Tr. I.	8 18 58	II. Sh. I.	16 14 49 30	I.*Ec. R.	24 12 34	I.*Tr.
11 28	I.*Sh. I.	21 29	II. Sh. E.			13 52	I.*Sh.
12 25	I.*Tr. E.			17 8 29	I. Tr. I.	15 49	II.*Oc.
13 38	I.*Sh. E.	9 9 23	I. Oc. D.	9 47	I. Sh. I.	18 22	II. Oc.
13 48	II.*Tr. I.	12 53 43	I.*Ec. R.	10 39	I. Tr. E.	18 27 28	II. Ec.
16 19	II.*Tr. E.			11 57	I.*Sh. E.	20 59 29	II. Ec.
16 20	II.*Sh. I.	10 6 35	I. Tr. I.	13 13	II.*Oc. D.		
18 51	II.*Sh. E.	7 52	I. Sh. I.	15 46	II.*Oc. R.	25 3 48	III. Oc.
		8 45	I. Tr. E.	15 51 8	II.*Ec. D.	6 4	III. Oc.
2 7 30	I. Oc. D.	10 2	I. Sh. E.	18 22 54	II. Ec. R.	7 42	I. Oc.
10 57 55	I. Ec. R.	10 40	II. Oc. D.	23 47	III. Oc. D.	9 8 28	III. Ec.
		13 12	II.*Oc. R.			11 14 8	I. Ec.
3 4 42	I. Tr. I.	13 14 58	II.*Ec. D.	18 2 2	III. Oc. R.	11 28 17	III.*Ec.
5 56	I. Sh. I.	15 46 32	II.*Ec. R.	5 6 51	III. Ec. D.		
6 52	I. Tr. E.	19 51	III. Oc. D.	5 46	I. Oc. D.	26 4 53	I. Tr.
8 6	I. Sh. E.	22 4	III. Oc. R.	7 25 22	III. Ec. R.	6 11	I. Sh.
8 9	II. Oc. D.			9 18 23	I. Ec. R.	7 3	I. Tr.
13 10 15	II.*Ec. R.	11 1 5 53	III. Ec. D.			8 21	I. Sh.
16 0	III.*Oc. D.	3 23 5	III. Ec. R.	19 2 58	I. Tr. I.	10 53	II. Tr.
18 10	III.*Oc. R.	3 52	I. Oc. D.	4 16	I. Sh. I.	13 26	II.*Tr.
21 5 3	III. Ec. D.	7 22 36	I. Ec. R.	5 8	I. Tr. E.	13 34	II.*Sh.
23 20 58	III. Ec. R.			6 26	I. Sh. E.	16 5	II.*Sh.
		12 1 4	I. Tr. I.	8 15	II. Tr. I.		
4 1 58	I. Oc. D.	2 21	I. Sh. I.	10 47	II. Tr. E.	27 2 11	I. Oc.
5 26 48	I. Ec. R.	3 13	I. Tr. E.	10 56	II. Sh. I.	5 43 6	I. Ec.
23 11	I. Tr. I.	4 30	I. Sh. E.	13 27	II.*Sh. E.	23 22	I. Tr.
		5 38	II. Tr. I.				
5 0 25	I. Sh. I.	8 11	II. Tr. E.	20 0 15	I. Oc. D.	28 0 40	I. Sh.
1 20	I. Tr. E.	8 18	II. Sh. I.	3 47 21	I. Ec. R.	1 31	I. Tr.
2 35	I. Sh. E.	10 49	II. Sh. E.	21 27	I. Tr. I.	2 51	I. Sh.
3 4	II. Tr. I.	22 20	I. Oc. D.	22 45	I. Sh. I.	5 8	II. Oc.
5 36	II. Tr. E.			23 37	I. Tr. E.	7 41	II. Oc.
5 40	II. Sh. I.	13 1 51 35	I. Ec. R.			7 45 38	II. Ec.
8 11	II. Sh. E.	19 32	I. Tr. I.	21 0 55	I. Sh. E.	10 17 44	II. Ec.
20 27	I. Oc. D.	20 49	I. Sh. I.	2 31	II. Oc. D.	17 57	III. Tr.
23 55 48	I. Ec. R.	21 42	I. Tr. E.	5 3	II. Oc. R.	20 12	III. Tr.
		22 59	I. Sh. E.	5 9 19	II. Ec. D.	20 40	I. Oc.
		23 56	II. Oc. D.	7 41 10	II. Ec. R.	23 16	III. Sh.
6 17 39	I.*Tr. I.			13 55	III.*Tr. I.		
18 54	I. Sh. I.	14 2 29	II. Oc. R.	16 8	III.*Tr. E.		
19 48	I. Tr. E.	2 33 5	II. Ec. D.	18 44	I. Oc. D.		
21 4	I. Sh. E.	5 4 42	II. Ec. R.	19 15	III. Sh. I.		
21 24	II. Oc. D.	9 58	III. Tr. I.	21 32	III. Sh. E.		
23 56	II. Oc. R.	12 9	III.*Tr. E.	22 16 15	I. Ec. R.		
23 56 56	II. Ec. D.	15 15	III.*Sh. I.				
		16 49	I.*Oc. D.	22 15 55	I.*Tr. I.		
7 2 28 24	II. Ec. R.	17 30	III.*Sh. E.	17 13	I.*Sh. I.		
6 4	III. Tr. I.	20 20 29	I. Ec. R.	18 5	I. Tr. E.		
8 13	III. Tr. E.			19 24	I. Sh. E.		
11 14	III.*Sh. I.			21 32	II. Tr. I.		
13 28	III.*Sh. E.	15 14 1	I.*Tr. I.				
14 55	I.*Oc. D.	15 18	I.*Sh. I.				
18 24 42	I.*Ec. R.	16 11	I.*Tr. E.	23 0 5	II. Tr. E.		
		17 28	I.*Sh. E.	0 15	II. Sh. I.		
8 12 7	I.*Tr. I.	18 56	II. Tr. I.	2 46	II. Sh. E.		
13 23	I.*Sh. I.	21 28	II. Tr. E.	13 14	I.*Oc. D.		
14 17	I.*Tr. E.	21 37	II. Sh. I.	16 45 15	I.*Ec. R.		
15 33	I.*Sh. E.						
16 21	II.*Tr. I.	16 0 8	II. Sh. E.	24 10 24	I. Tr. I.		
18 53	II. Tr. E.	11 18	I.*Oc. D.	11 42	I.*Sh. I.		

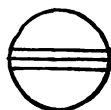
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; T transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

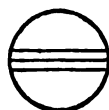
FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

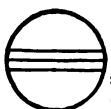


*
r

III.

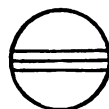


*
d *
r



*
d *
r

IV. No Eclipse.



Configurations at 14^h 45^m for an Inverting Telescope.

West.

East.

3.

1.



4.

•3

•2



•1

4.

1.



•3 •24.

4.



1•2.

•3

4.

2.

•1



3.

4.

•2



1.

3.

4.

3.



•1

•2

•4

3.

1.



•2.

•4

•3

2.



•1

•4

1.

•3



•2 ●

•4



•1

•3

•1



•3

•2



1.

•4

•1



•2

•4

3.



2.

•4

•3

2.



•4

•1 ●

•1



4.

•2 ●



•1

•4

•1



4.

•3

•2



4.

1.

3.

4.

•1



•2

4.

3.



1.

2.

4.

•3

2.



•1 ●

4.

•3

1.



•2

•4



•1

•3

•4

1.

2.



•3

•4

•2



1.

3.

•4

•1



3.

•2

GREENWICH MEAN TIME.

MARCH.

d h m s		d h m s		d h m s		d h m s	
1 011 59	I. Ec. R.	9 254	II. Tr. I.	17 17 28	I. Sh. I.	26 110 32	III. Ec.
134	III. Sh. E.	527	II. Tr. E.	18 26	I. Tr. E.	335 36	III. Ec.
17 51	I. Tr. I.	530	II. Sh. I.	19 39	I. Sh. E.	12 43	I.*Tr.
19 9	I. Sh. I.	8 2	II. Sh. E.	23 48	II. Oc. D.	13 53	I.*Sh.
20 1	I. Tr. E.	17 7	I. Oc. D.			14 54	I.*Tr.
21 19	I. Sh. E.	20 36 39	I. Ec. R.	18 44 9 49	II. Ec. R.	16 4	I. Sh.
				13 35	I.*Oc. D.	21 43	II. Tr.
2 013	II. Tr. I.	10 14 17	I.*Tr. I.	16 11	III.*Oc. D.		
246	II. Tr. E.	15 33	I.*Sh. I.	17 1 6	I. Ec. R.	27 0 4	II. Sh.
253	II. Sh. I.	16 28	I.*Tr. E.	18 34	III. Oc. R.	0 17	II. Tr.
524	II. Sh. E.	17 43	I. Sh. E.	21 10 23	III. Ec. D.	2 36	II. Sh.
15 10	I.*Oc. D.	21 6	II. Oc. D.	23 34 9	III. Ec. R.	10 3	I. Oc.
18 40 59	I. Ec. R.	23 40	II. Oc. R.			13 25 30	I.*Ec.
		23 40 28	II. Ec. D.	19 10 45	I. Tr. I.		
3 12 20	I.*Tr. I.			11 57	I.*Sh. I.	28 7 13	I. Tr.
13 38	I.*Sh. I.	11 212 56	II. Ec. R.	12 55	I.*Tr. E.	8 21	I. Sh.
14 31	I.*Tr. E.	11 36	I. Oc. D.	14 8	I.*Sh. E.	9 24	I. Tr.
15 48	I.*Sh. E.	12 0	III.*Oc. D.	18 59	II. Tr. I.	10 32	I. Sh.
18 27	II. Oc. D.	14 21	III.*Oc. R.	21 27	II. Sh. I.	15 53	II. Oc.
21 0	II. Oc. R.	15 530	I.*Ec. R.	21 32	II. Tr. E.	20 45 15	II. Ec.
21 3 53	II. Ec. D.	17 10 10	III. Ec. D.	23 59	II. Sh. E.		
23 36 8	II. Ec. R.	19 32 37	III. Ec. R.				
				20 8 4	I. Oc. D.	29 4 33	I. Oc.
4 7 52	III. Oc. D.	13 8 47	I. Tr. I.	11 30 1	I. Ec. R.	7 54 20	I. Ec.
9 39	I. Oc. D.	10 2	I. Sh. I.			10 41	III. T
10 11	III. Oc. R.	10 57	I. Tr. E.	21 5 14	I. Tr. I.	13 4	III.*T
13 9 21	III.*Ec. D.	12 12	I.*Sh. E.	6 26	I. Sh. I.	15 18	III.*S
13 9 50	I.*Ec. R.	16 15	II.*Tr. I.	7 25	I. Tr. E.	17 42	III. S
15 30 28	III.*Ec. R.	18 49	II. Tr. E.	8 37	I. Sh. E.		
		18 50	II. Sh. I.	13 9	II.*Oc. D.	30 1 43	I. T
5 6 50	I. Tr. I.	21 21	II. Sh. E.	18 8 12	II. Ec. R.	2 50	I. S
8 6	I. Sh. I.					3 54	I. T
9 0	I. Tr. E.	13 6 6	I. Oc. D.	22 234	I. Oc. D.	5 1	I. S
10 17	I. Sh. E.	9 34 26	I. Ec. R.	5 58 52	I. Ec. R.	11 6	II. T
13 34	II.*Tr. I.			6 26	III. Tr. I.	13 23	II.*S
16 6	II.*Tr. E.	14 316	I. Tr. I.	8 47	III. Tr. E.	13 40	II.*T
16 12	II.*Sh. I.	4 31	I. Sh. I.	11 18	III. Sh. I.	15 55	II. S
18 43	II. Sh. E.	5 27	I. Tr. E.	13 40	III.*Sh. E.	23 3	I. O
		6 41	I. Sh. E.	23 44	I. Tr. I.		
6 4 8	I. Oc. D.	10 27	II. Oc. D.			31 2 23 15	I. Ec.
7 38 48	I. Ec. R.	15 31 19	II.*Ec. R.	23 0 55	I. Sh. I.	20 13	I. T
				1 55	I. Tr. E.	21 19	I. S
7 1 19	I. Tr. I.	15 0 35	I. Oc. D.	3 6	I. Sh. E.	22 24	I. T
2 35	I. Sh. I.	212	III. Tr. I.	8 21	II. Tr. I.	23 30	I. S
3 29	I. Tr. E.	4 3 18	I. Ec. R.	10 45	II. Sh. I.		
4 46	I. Sh. E.	4 31	III. Tr. E.	10 54	II. Tr. E.		
7 46	II. Oc. D.	7 17	III. Sh. I.	13 17	II.*Sh. E.		
10 20	II. Oc. R.	9 37	III. Sh. E.	21 4	I. Oc. D.		
10 22 6	II. Ec. D.	21 46	I. Tr. I.				
12 54 27	II.*Ec. R.	22 59	I. Sh. I.	24 0 27 48	I. Ec. R.		
22 3	III. Tr. I.	23 56	I. Tr. E.	18 14	I. Tr. I.		
22 37	I. Oc. D.			19 24	I. Sh. I.		
		16 110	I. Sh. E.	20 24	I. Tr. E.		
3 0 20	III. Tr. E.	5 37	II. Tr. I.	21 35	I. Sh. E.		
2 7 40	I. Ec. R.	8 8	II. Sh. I.				
3 16	III. Sh. I.	8 10	II. Tr. E.	25 2 31	II. Oc. D.		
5 36	III. Sh. E.	10 40	II. Sh. E.	7 26 52	II. Ec. R.		
19 48	I. Tr. I.	19 5	I. Oc. D.	15 34	I.*Oc. D.		
21 4	I. Sh. I.	22 32 16	I. Ec. R.	18 56 37	I. Ec. R.		
21 58	I. Tr. E.			20 26	III. Oc. D.		
23 15	I. Sh. E.	17 16 15	I.*Tr. I.	22 50	III. Oc. R.		

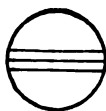
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

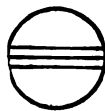
MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

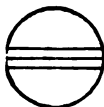


*
r

III.

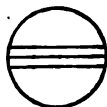


*
d *
r



*
r

IV. No Eclipse.



Configurations at 14^h 15^m for an Inverting Telescope.

West.

East.

3.	○	1 ¹ / ₄ 2.	
•3 2.	•○1	•4	
•3 •2	○	•4	
	○ •1 •2	•4	•3 ●
•1	○	•3 4.	
•2	○	•1 3.	4.
•1	○	• ³ / ₄ 4.	
3.	○	1. 2. 4.	
	4.		
3.	2. •1	○	
	1.		
•34.	•2	○	
4.		○	•2
		○	•1 ● •3 ●
4.	1. 2	○ •	•3
4.	2.	○	•1 3.
•4	1.	○	3.
	3.	○	1. 2.
•4	•3	○	
• ³ / ₄ • ³ / ₄	•1	○	
•3 •24	○1.		
	•○3 •4 •2		•1 ●
	1. ○ 2.	•3 •4	
2.	○	•1 3.	•4
1.	○	3.	•4
3.	○	1. 2.	4.
3.	•1 •	○	4.
•3 •2	○	1.	4.
	•3 •1	○	•24.
•	4.	○	2. •3
	4. 2.	○	•1 •3
4.	1. •2	○	3.
4.	3.	○	•1 •2
4.	3.	•1 2.	○
•4 •3 •2	○	1.	

GREENWICH MEAN TIME.

APRIL.

d h m s		d h m s		d h m s		d h m s	
1 516	II. Oc. D.	9 18 54	I. Tr. E.	18 14 7	I.*Sh. I.	27 7 20	III. Sh.
10 4 1	II. Ec. R.	19 55	I. Sh. E.	15 25	I. Tr. E.	9 44	I. T.
17 33	I. Oc. D.			16 19	I. Sh. E.	9 49	III. Sh.
20 52 4	I. Ec. R.	10 31 6	II. Tr. I.			10 31	I. S.
		518	II. Sh. I.	19 013	II. Oc. D.	11 56	I. T.
2 043	III. Oc. D.	550	II. Tr. E.	437 2	II. Ec. R.	12 43	I.*S.
3 8	III. Oc. R.	750	II. Sh. E.	1034	I. Oc. D.	22 16	II. T.
511 2	III. Ec. D.	14 3	I.*Oc. D.	13 40 15	I.*Ec. R.	23 49	II. S.
737 23	III. Ec. R.	17 16 15	I. Ec. R.	23 43	III. Tr. I.		
14 43	I.*Tr. I.					28 0 50	II. T.
15 48	I. Sh. I.	11 11 13	I. Tr. I.	20 211	III. Tr. E.	2 22	II. S.
16 54	I. Tr. E.	12 12	I.*Sh. I.	3 19	III. Sh. I.	7 5	I. C.
17 59	I. Sh. E.	13 24	I.*Tr. E.	5 47	III. Sh. E.	10 4 9	I. I.
		14 23	I.*Sh. E.	7 43	I. Tr. I.		
3 029	II. Tr. I.	21 25	II. Oc. D.	8 36	I. Sh. I.	29 4 14	I. T.
241	II. Sh. I.			9 55	I. Tr. E.	5 0	I. S.
3 2	II. Tr. E.	12 159 40	II. Ec. R.	10 48	I. Sh. E.	6 27	I. T.
5 14	II. Sh. E.	833	I. Oc. D.	19 27	II. Tr. I.	7 12	I. S.
12 3	I.*Oc. D.	11 45 3	I. Ec. R.	21 13	II. Sh. I.	16 27	II. C.
15 20 56	I.*Ec. R.	19 21	III. Tr. I.	22 1	II. Tr. E.	20 33 28	II. I.
		21 47	III. Tr. E.	23 45	II. Sh. E.		
4 9 13	I. Tr. I.	23 19	III. Sh. I.			30 1 36	I. C.
10 17	I. Sh. I.			21 5 4	I. Oc. D.	4 32 53	I. I.
11 24	I. Tr. E.	13 146	III. Sh. E.	8 9 5	I. Ec. R.	18 14	III. C.
12 28	I.*Sh. E.	543	I. Tr. I.			20 46	III. C.
18 39	II. Oc. D.	641	I. Sh. I.	22 213	I. Tr. I.	21 13 12	III. I.
23 22 27	II. Ec. R.	754	I. Tr. E.	3 5	I. Sh. I.	22 45	I. T.
		852	I. Sh. E.	4 25	I. Tr. E.	23 29	I. S.
5 633	I. Oc. D.	1639	II. Tr. I.	516	I. Sh. E.	23 44 49	III. I.
949 44	I. Ec. R.	1836	II. Sh. I.	1338	II.*Oc. D.		
15 0	III.*Tr. I.	1913	II. Tr. E.	17 55 59	II. Ec. R.		
17 25	III. Tr. E.	21 9	II. Sh. E.	23 35	I. Oc. D.		
19 19	III. Sh. I.						
21 44	III. Sh. E.	14 3 4	I. Oc. D.	23 237 50	I. Ec. R.		
		613 54	I. Ec. R.	13 49	III.*Oc. D.		
6 343	I. Tr. I.			16 19	III. Oc. R.		
445	I. Sh. I.	15 013	I. Tr. I.	17 13 0	III. Ec. D.		
554	I. Tr. E.	110	I. Sh. I.	19 43 18	III. Ec. R.		
657	I. Sh. E.	224	I. Tr. E.	20 44	I. Tr. I.		
13 52	II.*Tr. I.	321	I. Sh. E.	21 34	I. Sh. I.		
16 0	II. Sh. I.	1049	II. Oc. D.	22 56	I. Tr. E.		
16 26	II. Tr. E.	15 18 34	II. Ec. R.	23 46	I. Sh. E.		
18 32	II. Sh. E.	21 34	I. Oc. D.				
7 1 3	I. Oc. D.	16 042 40	I. Ec. R.	24 8 51	II. Tr. I.		
418 37	I. Ec. R.	9 25	III. Oc. D.	10 31	II. Sh. I.		
22 12	I. Tr. I.	11 54	III. Oc. R.	11 25	II. Tr. E.		
23 14	I. Sh. I.	13 12 41	III.*Ec. D.	13 4	II.*Sh. E.		
		15 41 40	III. Ec. R.	18 5	I. Oc. D.		
8 024	I. Tr. E.	18 43	I. Tr. I.	21 637	I. Ec. R.		
126	I. Sh. E.	1938	I. Sh. I.				
8 2	II. Oc. D.	20 55	I. Tr. E.	25 15 14	I. Tr. I.		
12 41 15	II.*Ec. R.	21 50	I. Sh. E.	16 2	I. Sh. I.		
1933	I. Oc. D.			17 26	I. Tr. E.		
22 47 25	I. Ec. R.	17 6 3	II. Tr. I.	18 14	I. Sh. E.		
		755	II. Sh. I.				
9 5 2	III. Oc. D.	837	II. Tr. E.	26 3 2	II. Oc. D.		
730	III. Ec. R.	1027	II. Sh. E.	7 14 26	II. Ec. R.		
911 34	III. Oc. D.	16 4	I. Oc. D.	12 35	I.*Oc. D.		
11 39 15	III. Ec. R.	19 11 29	I. Ec. R.	15 35 21	I. Ec. R.		
1643	I. Tr. I.						
17 43	I. Sh. I.	18 13 13	I.*Tr. I.	27 4 7	III. Tr. I.		
				638	III. Tr. E.		

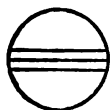
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

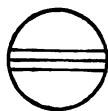
APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

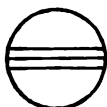


*
r

III.

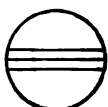


*
d *
r



*
r

IV. No Eclipse.



Configurations at 13^h 30^m for an Inverting Telescope.

West.

East.

•4

•3 •1

○

•2

•4

1 ○

•₂

2 •

•4

○

•3

•1 ●

•₂

○

•4

3 •

3 ○

•1

•2

•4

3 •

1 •

○

•4

•3

•2

○

1 •

•4

•3

•1

○

•2

4 •

○

•₂

2 •

4 •

2 •

•1

○

•34 •

•₁

○

•4

3 •

4 •

○

•₁

•2

4 •

3 •

1 •

○

•2

4 •

3 •

2 •

○

•1

4 •

•3

•1

○

•2 ●

•4

○

1 •

2 •

•3 ●

•4

2 •

•1

○

•3

•4

•2

○

3 •

•4

○

3 •

•2

•1 ●

3 •

1 •

•4

○

2 •

3 •

2 •

○

•1

•4

•3

1 •

○

•4

○

1 •

2 •

•4

•₁

○

•3

•4

•2

○

1 •

3 •

4 •

○

•₂

4 •

•1 ●

3 •

1 •

○

2 •

4 •

3 •

2 •

○

•₁

•3

1 •

•4

•2

○

4 •

•3

○

1 •

•2

GREENWICH MEAN TIME.

MAY.

d h m s		d h m s		d h m s		d h m s	
1 057	I. Tr. E.	5 11 59 7	I. Ec. R.	10 19 25 15	I. Ec. R.	15 7 46 26	III. Ec.
141	I. Sh. E.					17 18	II. Tr.
1140	II. Tr. I.	6 6 16	I. Tr. I.	11 13 0	III.*Tr. I.	18 19	II. Sh.
13 7	II.*Sh. I.	6 55	I. Sh. I.	13 47	I. Tr. I.	19 52	II. Tr.
14 14	II. Tr. E.	8 28	I. Tr. E.	14 22	I. Sh. I.	20 52	II. Sh.
15 41	II. Sh. E.	9 8	I. Sh. E.	15 20	III. Sh. I.		
20 6	I. Oc. D.	19 17	II. Oc. D.	15 34	III. Tr. E.	16 0 9	I. Oc.
23 138	I. Ec. R.	23 11 1	II. Ec. R.	16 0	I. Tr. E.	25 123	I. Ec.
				16 34	I. Sh. E.	21 18	I. Tr.
2 17 15	I. Tr. I.	7 337	I. Oc. D.	17 53	III. Sh. E.	21 48	I. Sh.
17 58	I. Sh. I.	6 27 50	I. Ec. R.			23 31	I. Tr.
19 28	I. Tr. E.	22 39	III. Oc. D.	12 353	II. Tr. I.		
20 10	I. Sh. E.			5 1	II. Sh. I.	17 0 1	I. Sh.
		8 046	I. Tr. I.	6 28	II. Tr. E.	11 33	II. Oc.
3 552	II. Oc. D.	124	I. Sh. I.	7 34	II. Sh. E.	15 7 6	II. Tr.
9 51 57	II. Ec. R.	259	I. Tr. E.	11 8	I. Oc. D.	18 39	I. Oc.
14 36	I. Oc. D.	336	I. Sh. E.	13 53 59	I. Ec. R.	21 20 2	I. Tr.
17 30 21	I. Ec. R.	345 40	III. Ec. R.				
		14 29	II. Tr. I.	13 8 17	I. Tr. I.	18 15 49	I. Tr.
4 8 33	III. Tr. I.	15 43	II. Sh. I.	8 50	I. Sh. I.	16 17	I. Sh.
11 5	III. Tr. E.	17 3	II. Tr. E.	10 30	I. Tr. E.	17 28	III. Tr.
11 20	III. Sh. I.	18 16	II. Sh. E.	11 3	I. Sh. E.	18 2	I. Tr.
11 45	I. Tr. I.	22 7	I. Oc. D.	22 8	II. Oc. D.	18 29	I. Sh.
12 26	I. Sh. I.					19 21	III. Tr.
13 51	III.*Sh. E.	9 056 33	I. Ec. R.	14 148 37	II. Ec. R.	20 4	III. Tr.
13 58	I.*Tr. E.	19 17	I. Tr. I.	5 38	I. Oc. D.	21 54	III. Tr.
14 39	I. Sh. E.	19 53	I. Sh. I.	8 22 40	I. Ec. R.		
		21 29	I. Tr. E.				
5 1 4	II. Tr. I.	22 5	I. Sh. E.	15 248	I. Tr. I.	19 6 43	II. Tr.
2 25	II. Sh. I.			3 6	III. Oc. D.	7 37	II. Tr.
3 39	II. Tr. E.	10 842	II. Oc. D.	3 19	I. Sh. I.	10 10	II. Sh.
4 58	II. Sh. E.	12 29 30	II. Ec. R.	5 1	I. Tr. E.	13 9	I.*Oc.
9 7	I. Oc. D.	16 38	I. Oc. D.	5 32	I. Sh. E.	15 48 45	I. Tr.

By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from May 20 to July 9.

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

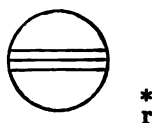
GREENWICH MEAN TIME.

MAY.

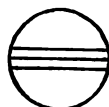
Phases of the Eclipses of the Satellites for an Inverting Telescope.



III.



IV. No Eclipse.



Configurations at 13^h 15^m for an Inverting Telescope.

West.

East.

4.	•1	○	•3	
4.	•2	○	1.	•3
•4		•1○	•2	3.
•4		3.○	2.	.
•4	3.	2.	○	•1
•3	•4	¹ / ₄ ○		
	•3	○	•1	•2
	•1	2○	•3	•4
	•2	○	1.	•3 •4
		•1○	•2	3.
		1○	•2	•4
3.	2.	○		4.
•3	•21.	○		4.
	•3	○	•1 •2	4.
	1.	○	2. ⁴ / ₃	
	2.	4.	○	1.
4.	•1	○	3.	
4.		○	³ / ₁ .	2.
4.	3.	2.	○	
•4	3.	•2	1.○	

GREENWICH MEAN TIME.

JULY.

By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from May 20 to July 9.

d h m s		d h m s		d h m s		d h m s	
10 0 3	I. Oc. R.	15 7 49	II. Tr. E.	21 11 43	I. Sh. E.	26 17 36	I.
18 38	I. Sh. I.	8 8	III. Tr. E.	-12 20	I. Tr. E.	19 9	I.
19 3	I. Tr. I.					19 50	I.
20 52	I. Sh. E.	16 2 4	I. Sh. I.	22 6 43 57	I. Ec. D.		
21 18	I.*Tr. E.	2 34	I. Tr. I.	6 49	II. Sh. I.	27 14 9 14	I.
		4 17	I. Sh. E.	7 18	III. Sh. I.	14 44 57	II.
11 13 7 48	III. Ec. D.	4 49	I. Tr. E.	8 0	II. Tr. I.	17 4	I.
14 57	II. Sh. I.	22 49 47	II. Ec. D.	9 23	II. Sh. E.	18 48	II.
15 49	II. Tr. I.	23 18 37	I. Ec. D.	9 34	I. Oc. R.		
15 53 12	I. Ec. D.			9 44	III. Tr. I.	28 11 24	I.
17 32	II. Sh. E.	17 2 3	I. Oc. R.	10 3	III. Sh. E.	12 6	I.
17 43	III. Oc. R.	2 33	II. Oc. R.	10 36	II. Tr. E.	13 38	I.
18 25	II. Tr. E.	20 33	I. Sh. I.	12 36	III. Tr. E.	14 20	I.
18 33	I. Oc. R.	21 5	I.*Tr. I.				
		22 46	I. Sh. E.	23 3 58	I. Sh. I.	29 8 37 40	I.
19 13 7	I. Sh. I.	23 19	I. Tr. E.	4 35	I. Tr. I.	9 23	II.
13 34	I. Tr. I.			6 12	I. Sh. E.	10 47	II.
15 20	I. Sh. E.	18 17 6 54	III. Ec. D.	6 50	I. Tr. E.	11 17	III.
15 48	I. Tr. E.	17 32	II. Sh. I.			11 34	I.
		17 47 3	I. Ec. D.	24 1 12 24	I. Ec. D.	11 57	II.
13 9 30 48	II. Ec. D.	18 37	II. Tr. I.	1 26 54	II. Ec. D.	13 23	II.
10 21 40	I. Ec. D.	20 6	II. Sh. E.	4 4	I. Oc. R.	14 4	III.
13 3	I. Oc. R.	20 33	I. Oc. R.	5 24	II. Oc. R.	14 9	III.
13 7	II. Oc. R.	21 12	II.*Tr. E.	22 27	I. Sh. I.	17 3	III.
		22 11	III. Oc. R.	23 6	I. Tr. I.		
14 7 35	I. Sh. I.					30 5 53	I.
8 4	I. Tr. I.	19 15 1	I. Sh. I.	25 0 41	I. Sh. E.	6 36	I.
9 49	I. Sh. E.	15 35	I. Tr. I.	1 20	I. Tr. E.	8 6	I.
10 18	I. Tr. E.	17 15	I. Sh. E.	19 40 49	I. Ec. D.	8 51	I.
		17 49	I. Tr. E.	20 6	II. Sh. I.		
15 3 19	III. Sh. I.			21 6 34	III.*Ec. D.	31 3 6 6	I.
4 14	II. Sh. I.	20 12 7 52	II. Ec. D.	21 23	II.*Tr. I.	4 3 55	II.
4 50 9	I. Ec. D.	12 15 29	I. Ec. D.	22 34	I. Oc. R.	6 4	I.
5 13	II. Tr. I.	15 4	I. Oc. R.	22 40	II. Sh. E.	8 14	II.
5 17	III. Tr. I.	15 58	II. Oc. R.	23 59	II. Tr. E.		
6 3	III. Sh. E.						
6 49	II. Sh. E.	21 9 30	I. Sh. I.	26 2 39	III. Oc. R.		
7 33	I. Oc. R.	10 5	I. Tr. I.	16 56	I. Sh. I.		

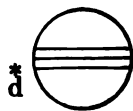
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

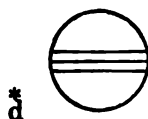
GREENWICH MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



III.



IV. No Eclipse.



Configurations at 21^h 0^m for an Inverting Telescope.

[illegible]

GREENWICH MEAN TIME.

AUGUST.

d h m s		d h m s		d h m s		d h m s	
1 0 22	I. Sh. I.	9 5 32	II. Tr. E.	17 23 2	I. Oc. R.	26 21 45	II.*Tr. I.
1 6	I. Tr. I.	7 53 25	III. Ec. R.			22 14	II. Sh. E.
2 35	I. Sh. E.	8 32	III. Oc. D.	18 3 15	II. Oc. R.		
3 20	I. Tr. E.	11 29	III. Oc. R.	17 7	I. Sh. I.	27 0 22	II. Tr. E.
21 34 30	I.*Ec. D.	20 44	I.*Sh. I.	18 6	I. Tr. I.	3 15	III. Sh. I.
22 40	II. Sh. I.	21 37	I.*Tr. I.	19 21	I.*Sh. E.	6 5	III. Sh. E.
		22 58	I. Sh. E.	20 20	I.*Tr. E.	7 33	III. Tr. I.
2 0 10	II. Tr. I.	23 51	I. Tr. E.			10 33	III. Tr. E.
0 34	I. Oc. R.			19 14 18 24	I. Ec. D.	13 30	I. Sh. I.
1 5 26	III. Ec. D.	10 17 56 29	I. Ec. D.	17 5	II. Sh. I.	14 34	I. Tr. I.
1 14	II. Sh. E.	19 58 41	II.*Ec. D.	17 32	I. Oc. R.	15 43	I. Sh. E.
2 46	II. Tr. E.	21 3	I.*Oc. R.	19 2	II.*Tr. I.	16 49	I. Tr. E.
3 53 30	III. Ec. R.			19 40	II.*Sh. E.		
4 9	III. Oc. D.	11 0 27	II. Oc. R.	21 39	II.*Tr. E.	28 10 40 15	I. Ec. D.
7 5	III. Oc. R.	15 13	I. Sh. I.	23 16	III. Sh. I.	14 0	I. Oc. R.
18 50	I. Sh. I.	16 7	I. Tr. I.			14 30 41	II. Ec. D.
19 37	I. Tr. I.	17 27	I. Sh. E.	20 2 5	III. Sh. E.	19 25	II.*Oc. R.
21 4	I.*Sh. E.	18 21	I. Tr. E.	3 15	III. Tr. I.		
21 51	I. Tr. E.			6 14	III. Tr. E.	29 7 59	I. Sh. I.
3 16 2 53	I. Ec. D.	12 12 24 53	I. Ec. D.	11 36	I. Sh. I.	9 4	I. Tr. I.
17 21 51	II. Ec. D.	14 31	II. Sh. I.	12 36	I. Tr. I.	10 12	I. Sh. E.
19 4	I. Oc. R.	15 33	I. Oc. R.	13 49	I. Sh. E.	11 18	I. Tr. E.
21 38	II.*Oc. R.	16 18	II. Tr. I.	14 50	I. Tr. E.		
		17 6	II. Sh. E.			30 5 8 35	I. Ec. D.
4 13 19	I. Sh. I.	18 54	II. Tr. E.	21 8 46 48	I. Ec. D.	8 29	I. Oc. R.
14 7	I. Tr. I.	19 16	III. Sh. I.	11 54 11	II. Ec. D.	8 56	II. Sh. I.
15 32	I. Sh. E.	22 4	III. Sh. E.	12 2	I. Oc. R.	11 6	II. Tr. I.
16 21	I. Tr. E.	22 55	III. Tr. I.	16 39	II. Oc. R.	11 31	II. Sh. E.
5 10 31 18	I. Ec. D.					13 44	II. Tr. E.
11 57	II. Sh. I.	13 1 52	III. Tr. E.	22 9 5	I. Sh. I.	16 59 3	III. Ec. D.
13 32	II. Tr. I.	9 42	I. Sh. I.	7 6	I. Tr. I.	19 51 56	III.*Ec. R.
13 34	I. Oc. R.	10 36	I. Tr. I.	8 18	I. Sh. E.	21 27	III.*Oc. D.
14 32	II. Sh. E.	11 55	I. Sh. E.	9 20	I. Tr. E.		
15 17	III. Sh. I.	12 51	I. Tr. E.			31 0 30	III. Oc. R.
16 9	II. Tr. E.	14 6 53 17	I. Ec. D.	23 3 15 8	I. Ec. D.	2 27	I. Sh. I.
18 4	III. Sh. E.	9 17 32	II. Ec. D.	6 22	II. Sh. I.	3 34	I. Tr. I.
18 33	III. Tr. I.	10 3	I. Oc. R.	6 31	I. Oc. R.	4 41	I. Sh. E.
21 28	III.*Tr. E.	13 52	II. Oc. R.	8 24	II. Tr. I.	5 48	I. Tr. E.
				8 57	II. Sh. E.	23 36 56	I. Ec. D.
6 7 47	I. Sh. I.	15 4 10	I. Sh. I.	11 1	II. Tr. E.		
8 37	I. Tr. I.	5 6	I. Tr. I.	13 0 27	III. Ec. D.		
10 1	I. Sh. E.	6 24	I. Sh. E.	15 52 8	III. Ec. R.		
10 51	I. Tr. E.	7 21	I. Tr. E.	17 11	III. Oc. D.		
				20 12	III.*Oc. R.		
7 4 59 43	I. Ec. D.	16 1 21 39	I. Ec. D.				
6 40 46	II. Ec. D.	3 48	II. Sh. I.	24 0 33	I. Sh. I.		
8 4	I. Oc. R.	4 33	I. Oc. R.	1 35	I. Tr. I.		
11 3	II. Oc. R.	5 40	II. Tr. I.	2 46	I. Sh. E.		
		6 23	II. Sh. E.	3 49	I. Tr. E.		
		8 17	II. Tr. E.	21 43 30	I.*Ec. D.		
8 2 16	I. Sh. I.	9 2 18	III. Ec. D.				
3 7	I. Tr. I.	11 52 47	III. Ec. R.	25 1 1	I. Oc. R.		
4 29	I. Sh. E.	12 52	III. Oc. D.	1 12 1	II. Ec. D.		
5 21	I. Tr. E.	15 51	III. Oc. R.	6 2	II. Oc. R.		
23 28 6	I. Ec. D.	22 39	I. Sh. I.	19 2	I.*Sh. I.		
		23 36	I. Tr. I.	20 5	I.*Tr. I.		
9 1 14	II. Sh. I.			21 15	I.*Sh. E.		
2 33	I. Oc. R.	17 0 52	I. Sh. E.	22 19	I. Tr. E.		
2 55	II. Tr. I.	1 51	I. Tr. E.				
3 49	II. Sh. E.	19 50 1	I.*Ec. D.	26 16 11 51	I. Ec. D.		
5 4 9	III. Ec. D.	22 35 25	II. Ec. D.	19 30	I.*Oc. R.		
				19 38	II.*Sh. I.		

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

SEPTEMBER.

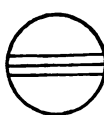



d h m s		d h m s		d h m s		d h m s	
1 2 59	I. Oc. R.	9 23 25	I. Oc. R.	17 18 5	III.*Sh. E.	25 3 23	III. Tr.
3 48 30	II. Ec. D.			19 12	I.*Sh. I.	18 13 46	I.*Ec.
8 47	II. Oc. R.	10 0 46	II. Sh. I.	20 12	III.*Tr. I.	21 46	I.*Oc.
20 56	I.*Sh. I.	3 8	II. Tr. I.	20 27	I.*Tr. I.		
22 3	I.*Tr. I.	3 22	II. Sh. E.	21 25	I.*Sh. E.	26 0 55 5	II. Ec.
23 9	I. Sh. E.	5 46	II. Tr. E.	22 41	I. Tr. E.	6 14	II. Oc.
		11 13	III. Sh. I.	23 16	III. Tr. E.	15 35	I. Sh.
3 0 17	I. Tr. E.	14 5	III. Sh. E.			16 51	I. Tr.
18 5 17	I. Ec. D.	16 2	III. Tr. I.	18 16 20 25	I. Ec. D.	17 48	I.*Sh.
21 28	I.*Oc. R.	17 18	I. Sh. I.	19 51	I.*Oc. R.	19 5	I.*Tr.
22 12	II. Sh. I.	18 30	I.*Tr. I.	22 19 13	II.*Ec. D.		
		19 5	III.*Tr. E.			27 12 42 5	I. Ec.
3 0 27	II. Tr. I.	19 31	I.*Sh. E.	19 3 34	II. Oc. R.	16 15	I. Oc.
0 48	II. Sh. E.	20 44	I.*Tr. E.	9 17	IV. Oc. D.	18 48	IV.*Tr.
3 4	II. Tr. E.			10 18	IV. Oc. R.	19 11	II.*Sh.
7 14	III. Sh. I.	11 0 13	IV. Tr. I.	13 41	I. Sh. I.	20 14	IV.*Tr.
10 5	III. Sh. E.	1 4	IV. Tr. E.	14 56	I. Tr. I.	21 45	II.*Tr.
11 49	III. Tr. I.	14 27 3	I. Ec. D.	15 54	I. Sh. E.	21 47	II.*Sh.
14 51	III. Tr. E.	17 54	I.*Oc. R.	17 10	I. Tr. E.		
15 24	I. Sh. I.	19 43 13	II.*Ec. D.			28 0 23	II. Tr.
16 33	I. Tr. I.			20 10 48 44	I. Ec. D.	8 53 45	III. Ec.
17 38	I. Sh. E.	12 0 53	II. Oc. R.	14 20	I. Oc. R.	10 3	I. Sh.
18 47	I.*Tr. E.	11 47	I. Sh. I.	16 37	II. Sh. I.	11 20	I. Tr.
		12 59	I. Tr. I.	19 7	II.*Tr. I.	11 51 16	III. Ec.
4 12 33 40	I. Ec. D.	14 0	I. Sh. E.	19 13	II.*Sh. E.	12 16	I. Sh.
15 57	I. Oc. R.	15 13	I. Tr. E.	21 45	II.*Tr. E.	13 34	I. Tr.
17 7 2	II. Ec. D.					14 7	III. Oc.
22 10	II. Oc. R.	13 8 55 24	I. Ec. D.	21 4 55 24	III. Ec. D.	17 14	III.*Oc.
		12 23	I. Oc. R.	7 51 47	III. Ec. R.		
5 9 53	I. Sh. I.	14 3	II. Sh. I.	8 9	I. Sh. I.	29 7 10 26	I. Ec.
11 2	I. Tr. I.	16 28	II. Tr. I.	9 25	I. Tr. I.	10 43	I. Oc.
12 6	I. Sh. E.	16 39	II. Sh. E.	10 2	III. Oc. D.	14 12 41	II. Ec.
13 16	I. Tr. E.	19 6	II.*Tr. E.	10 22	I. Sh. E.	19 32	II.*Oc.
				11 39	I. Tr. E.		
6 7 2 0	I. Ec. D.	14 0 56 56	III. Ec. D.	13 9	III. Oc. R.	30 4 31	I. Sh.
10 27	I. Oc. R.	3 52 10	III. Ec. R.			5 49	I. Tr.
11 29	II. Sh. I.	5 54	III. Oc. D.	22 5 17 4	I. Ec. D.	6 45	I. Sh.
13 48	II. Tr. I.	6 15	I. Sh. I.	8 48	I. Oc. R.	8 3	I. Tr.
14 5	II. Sh. E.	7 28	I. Tr. I.	11 36 51	II. Ec. D.		
16 26	II. Tr. E.	8 28	I. Sh. E.	16 54	II. Oc. R.		
20 57 41	III.*Ec. D.	8 59	III. Oc. R.				
23 51 45	III. Ec. R.	9 42	I. Tr. E.	23 2 38	I. Sh. I.		
				3 54	I. Tr. I.		
7 1 42	III. Oc. D.	15 3 23 42	I. Ec. D.	4 51	I. Sh. E.		
4 21	I. Sh. I.	6 53	I. Oc. R.	6 8	I. Tr. E.		
4 46	III. Oc. R.	9 0 53	II. Ec. D.	23 45 24	I. Ec. D.		
5 32	I. Tr. I.	14 13	II. Oc. R.				
6 35	I. Sh. E.						
7 46	I. Tr. E.	16 0 44	I. Sh. I.	24 3 17	I. Oc. R.		
		1 58	I. Tr. I.	5 54	II. Sh. I.		
3 1 30 20	I. Ec. D.	2 57	I. Sh. E.	8 26	II. Tr. I.		
4 56	I. Oc. R.	4 12	I. Tr. E.	8 30	II. Sh. E.		
6 24 42	II. Ec. D.	21 52 2	I.*Ec. D.	11 5	II. Tr. E.		
11 31	II. Oc. R.			19 10	III.*Sh. I.		
22 50	I. Sh. I.	17 1 22	I. Oc. R.	21 6	I.*Sh. I.		
		3 20	II. Sh. I.	22 4	III.*Sh. E.		
9 0 1	I. Tr. I.	5 48	II. Tr. I.	22 23	I.*Tr. I.		
1 3	I. Sh. E.	5 56	II. Sh. E.	23 19	I. Sh. E.		
2 15	I. Tr. E.	8 26	II. Tr. E.	25 0 19	III. Tr. I.		
19 58 41	I.*Ec. D.	15 11	III. Sh. I.	0 37	I. Tr. E.		

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

	III.	
[*] d	[*] d [*] r	
	IV. No Eclipse.	
[*] d		

Configurations at 20^h 0^m for an Inverting Telescope.

West.		East.	
	•4 ○ 1• •2 3•		
	○ ⁺ 4 3•		•1 ●
	2• 3• 1• ○ •4		
	3• ○ •1 •4		•2 ●
	•3 1• ○ 2• •4		
	⁺ 3 ○ 1• 4•		
	•2 •1 ○ •3 4•		
	○ 1• •2 •3 4•		
	○ 2• ⁺ 4 •		•1 ●
1•	2• 3• ○ 4•		
	3• 4• ○ •1		•2 ●
	4• •3 1• ○ •2		
	4• •3 2• ○ •1		
	4• •2 •1 ○ •3		
	•4 ○ 1• ⁺ 2 •3		
	•4 •1 ○ 2• 3•		
	⁺ 3		
	•4 2• 1 ○ •		
	3• •4 •2 ○ •1		
	•3 1• ○ •4 •2		
2•	•3 ○ •1 •4		
	•2 1• ○ •3 •4		
	○ •2 1• •3 •4		
	•1 ○ 2• 3• 4•		
	2• ○ ⁺ 1 • 4•		
	3• •2 ○ 4•		•1 ●
	3• 1• ○ ⁺ 4		
4•	•3 ○ 2• •1		
	⁺ 4 1• ○ •3		
	4• ○ •2 •1 •3		
	4• •1 ○ 2• 3•		

GREENWICH MEAN TIME.

OCTOBER.

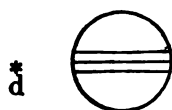
d h m s		d h m s		d h m s		d h m s	
1 138 45	I. Ec. D.	9 211	I. Tr. I.	17 327	I. Oc. R.	25 20 15 41	I.*Ec.
512	I. Oc. R.	3 7	I. Sh. E.	841 44	II. Ec. D.	23 46	I. Oc.
828	II. Sh. I.	3 7	III. Sh. I.	14 0	II. Oc. R.		
11 3	II. Tr. I.	425	I. Tr. E.	2116	I.*Sh. I.	26 528	II. Sh.
11 5	II. Sh. E.	6 4	III. Sh. E.	2232	I.*Tr. I.	757	II. Tr.
1342	II. Tr. E.	821	III. Tr. I.	2329	I. Sh. E.	8 6	II. Sh.
23 0	I. Sh. I.	1128	III. Tr. E.			1036	II. Tr.
23 8	III. Sh. I.	22 030	I.*Ec. D.	18 046	I. Tr. E.	1738	I.*S
				1822 14	I.*Ec. D.	1851	I.*T
2 017	I. Tr. I.	10 134	I. Oc. R.	2155	I.*Oc. R.	1951	I.*S
113	I. Sh. E.	6 619	II. Ec. D.			21 5	I.*T
2 4	III. Sh. E.	1126	II. Oc. R.	19 254	II. Sh. I.		
231	I. Tr. E.	1922	I.*Sh. I.	527	II. Tr. I.	27 046 41	III. F
422	III. Tr. I.	2039	I.*Tr. I.	531	II. Sh. E.	348 43	III. F
727	III. Tr. E.	2135	I.*Sh. E.	8 6	II. Tr. E.	546	III. C
20 7 7	I.*Ec. D.	2253	I. Tr. E.	1544	I.*Sh. I.	856	III. C
2341	I. Oc. R.			17 0	I.*Tr. I.	1444 5	I. F
				1757	I.*Sh. E.	1814	I.*C
3 330 46	II. Ec. D.	11 16 28 49	I.*Ec. D.	1914	I.*Tr. E.		
851	II. Oc. R.	20 2	I.*Oc. R.	2048 6	III.*Ec. D.	28 034 20	II. C
1728	I.*Sh. I.	12 019	II. Sh. I.	2349 1	III. Ec. R.	545	II. C
1846	I.*Tr. I.	255	II. Tr. I.			12 6	I. F
1942	I.*Sh. E.	256	II. Sh. E.	20 157	III. Oc. D.	1319	I. F
21 0	I.*Tr. E.	534	II. Tr. E.	5 7	III. Oc. R.	1420	I. F
		1350	I. Sh. I.	1250 36	I. Ec. D.	1533	I.*C
4 14 35 27	I. Ec. D.	15 8	I. Tr. I.	1623	I.*Oc. R.		
18 9	I.*Oc. R.	16 4	I.*Sh. E.	2159 10	II.*Ec. D.	29 9 12 25	I. F
2145	II.*Sh. I.	1649 35	III.*Ec. D.			1241	I. C
		1722	I.*Tr. E.	21 315	II. Oc. R.	1845	II.*C
5 021	II. Tr. I.	1949 22	III.*Ec. R.	1012	I. Sh. I.	2111	II.*C
022	II. Sh. E.	22 4	III.*Oc. D.	1128	I. Tr. I.	2123	II.*C
259	II. Tr. E.			1226	I. Sh. E.	2351	II. C
1157	I. Sh. I.	13 114	III. Oc. R.	1342	I. Tr. E.		
1251 38	III. Ec. D.	1057 12	I. Ec. D.			30 634	I. F
1314	I. Tr. I.	1431	I. Oc. R.	22 7 18 56	I. Ec. D.	746	I. F
1410	I. Sh. E.	1923 48	II.*Ec. D.	1051	I. Oc. R.	848	I. F
1528	I. Tr. E.			1611	II.*Sh. I.	10 0	I. F
1550 18	III. Ec. R.	14 043	II. Oc. R.	1842	II.*Tr. I.	15 3	III.*C
18 7	III.*Oc. D.	819	I. Sh. I.	1849	II.*Sh. E.	18 3	III.*C
2116	III.*Oc. R.	936	I. Tr. I.	21 7	IV.*Oc. D.	19 3	IV.*C
		1032	I. Sh. E.	2122	II.*Tr. E.	1949	IV.*C
6 336	IV. Oc. D.	1150	I. Tr. E.	2257	IV. Oc. R.	1953	III.*C
5 7	IV. Oc. R.	1244	IV. Tr. I.			23 2	III.*C
9 348	I. Ec. D.	1428	IV. Tr. E.	23 441	I. Sh. I.		
1238	I. Oc. R.			556	I. Tr. I.	31 340 50	I. F
1648 20	II.*Ec. D.	15 525 30	I. Ec. D.	654	I. Sh. E.	547	IV. C
22 9	II.*Oc. R.	859	I. Oc. R.	810	I. Tr. E.	7 9	I. C
		1337	II. Sh. I.	11 4	III. Sh. I.	745	IV. C
7 625	I. Sh. I.	1611	II.*Tr. I.	14 4	III. Sh. E.	1352 5	II. C
743	I. Tr. I.	1614	II.*Sh. E.	16 7	III.*Tr. I.	1859	II.*C
838	I. Sh. E.	1850	II.*Tr. E.	1915	III.*Tr. E.		
957	I. Tr. E.						
		16 247	I. Sh. I.	24 147 21	I. Ec. D.		
8 332 7	I. Ec. D.	4 4	I. Tr. I.	518	I. Oc. R.		
7 6	I. Oc. R.	5 0	I. Sh. E.	1117 0	II. Ec. D.		
11 2	II. Sh. I.	618	I. Tr. E.	1630	II.*Oc. R.		
1338	II. Tr. I.	7 6	III. Sh. I.	23 9	I. Sh. I.		
1339	II. Sh. E.	10 4	III. Sh. E.				
1617	II.*Tr. E.	1216	III. Tr. I.	25 024	I. Tr. I.		
		1524	III. Tr. E.	123	I. Sh. E.		
9 054	I. Sh. I.	23 53 54	I. Ec. D.	237	I. Tr. E.		

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

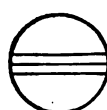
OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.


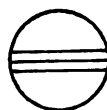
III.

*d

*r



IV. No Eclipse.


Configurations at 19^h 15^m for an Inverting Telescope.

West.

East.

4.	2.	○	1.	3.
4	3.	○	1	○
4	3.	○	2	
4.3	○	1.		
2.	1.	○		3. ●
	○	1.	3	2. ●
1.	○	2.	3.	
2.	○	1.3.	4	
2.3.1	○	4		
3.	○	1.	2	4.
3	○	2.	4.	1. ●
2.	1.	○	4.	3. ●
2	○	1.4.	3	
1.	4.	○	2	3.
4.	○	1.	3.	
4.	2.	1.	○	
4.	3.	○	1.	2
4	3	○	2.	
4	2.	3	○	1.
4	2.	○	1.	3
4	1.	○	2	3
	○	1.	3.	
2.	1.	○	4	
3.	○	1.	4	
3	1.	○	2.	4
3.	○		4	
2.	○	1.	3	4.
1.	○	2.	3	4.
	○	2.	1	3.4.
2.	1.	○	4.	
3.	4.	○	2	1.

GREENWICH MEAN TIME.

NOVEMBER.

d h m s		d h m s		d h m s		d h m s	
1 1 3	I. Sh. I.	9 3 25	I. Oc. R.	17 0 18	I. Tr. I.	25 1 27	I. Oc. R.
2 13	I. Tr. I.	10 37	II. Sh. I.	1 32	I. Sh. E.	5 18	IV. Oc. D.
3 16	I. Sh. E.	12 50	II. Tr. I.	2 32	I. Tr. E.	7 24	IV. Oc. R.
4 27	I. Tr. E.	13 16	II. Sh. E.	12 43 1	III. *Ec. D.	10 54 2	IV. Ec. D.
22 9 12	I. *Ec. D.	15 31	II. *Tr. E.	15 48 16	III. *Ec. R.	15 19	II. *Oc. R.
		21 25	I. *Sh. I.	16 43	III. *Oc. D.	19 40	I. *Sh. I.
3 136	I. Oc. R.	22 30	I. *Tr. I.	19 55	III. *Oc. R.	20 31	I. *Tr. I.
8 3	II. Sh. I.	23 38	I. Sh. E.	20 24 55	I. *Ec. D.	21 54	I. *Sh. E.
10 25	II. Tr. I.			23 40	I. Oc. R.	22 45	I. *Tr. E.
10 41	II. Sh. E.	10 0 44	I. Tr. E.				
13 5	II. Tr. E.	8 44 30	III. Ec. D.	18 8 19 15	II. Ec. D.	26 16 47 9	I. *Ec. D.
19 31	I. *Sh. I.	11 48 42	III. Ec. R.	12 59	II. Oc. R.	19 53	I. *Oc. R.
20 41	I. *Tr. I.	13 9	III. Oc. D.	17 47	I. *Sh. I.		
21 45	I. *Sh. E.	16 21	III. *Oc. R.	18 44	I. *Tr. I.	27 5 5	II. Sh. I.
22 55	I. *Tr. E.	18 31 13	I. *Ec. D.	20 1	I. *Sh. E.	6 45	II. Tr. I.
		21 53	I. *Oc. R.	20 59	I. *Tr. E.	7 45	II. Sh. E.
3 4 45 56	III. Ec. D.					9 27	II. Tr. E.
7 49 4	III. Ec. R.	11 5 44 23	II. Ec. D.	19 14 53 19	I. *Ec. D.	14 9	I. *Sh. I.
9 30	III. Oc. D.	10 36	II. Oc. R.	18 7	I. *Oc. R.	14 57	I. *Tr. I.
12 41	III. Oc. R.	15 53	I. *Sh. I.			16 23	I. *Sh. E.
16 37 37	I. *Ec. D.	16 57	I. *Tr. I.	20 2 30	II. Sh. I.	17 12	I. *Tr. E.
20 4	I. *Oc. R.	18 7	I. *Sh. E.	4 25	II. Tr. I.		
		19 11	I. *Tr. E.	5 9	II. Sh. E.	28 6 56	III. Sh. I.
4 3 9 27	II. Ec. D.			7 6	II. Tr. E.	10 2	III. Sh. E.
8 12	II. Oc. R.	12 12 59 36	I. Ec. D.	12 15	I. Sh. I.	10 10	III. Tr. I.
14 0	I. Sh. I.	16 20	I. *Oc. R.	13 11	I. Tr. I.	11 15 43	I. Ec. D.
15 8	I. *Tr. I.	23 55	II. Sh. I.	14 29	I. *Sh. E.	13 20	III. *Tr. E.
16 13	I. *Sh. E.			15 25	I. *Tr. E.	14 20	I. *Oc. R.
17 23	I. *Tr. E.	13 2 2	II. Tr. I.				
5 11 5 58	I. Ec. D.	2 34	II. Sh. E.	21 2 57	III. Sh. I.	29 0 11 23	II. Ec. D.
14 31	I. *Oc. R.	4 43	II. Tr. E.	6 1	III. Sh. E.	4 28	II. Oc. R.
21 20	II. *Sh. I.	10 21	I. Sh. I.	6 42	III. Tr. I.	8 37	I. Sh. I.
23 38	II. Tr. I.	11 24	I. Tr. I.	9 21 49	I. Ec. D.	9 24	I. Tr. I.
23 59	II. Sh. E.	12 35	I. Sh. E.	9 52	III. Tr. E.	10 51	I. Sh. E.
		13 38	I. Tr. E.	12 34	I. Oc. R.	11 38	I. Tr. E.
		22 59	III. *Sh. I.	21 36 46	II. *Ec. D.		
6 2 18	II. Tr. E.						
8 28	I. Sh. I.	14 2 2	III. Sh. E.	22 2 9	II. Oc. R.	30 5 44 8	I. Ec. D.
9 36	I. Tr. I.	3 10	III. Tr. I.	6 43	I. Sh. I.	8 46	I. Oc. R.
10 42	I. Sh. E.	6 20	III. Tr. E.	7 38	I. Tr. I.	18 23	II. *Sh. I.
11 50	I. Tr. E.	7 28 4	I. Ec. D.	8 57	I. Sh. E.	19 54	II. *Tr. I.
19 1	III. *Sh. I.	10 47	I. Oc. R.	9 52	I. Tr. E.	21 3	II. *Sh. E.
22 2	III. *Sh. E.	19 2 0	II. *Ec. D.			22 36	II. *Tr. E.
23 34	III. Tr. I.	23 48	II. Oc. R.	23 3 50 14	I. Ec. D.		
7 2 43	III. Tr. E.			7 0	I. Oc. R.		
5 34 24	I. Ec. D.	15 4 50	I. Sh. I.	15 47	II. *Sh. I.		
8 58	I. Oc. R.	5 51	I. Tr. I.	17 35	II. *Tr. I.		
16 27 4	II. *Ec. D.	7 4	I. Sh. E.	18 27	II. *Sh. E.		
21 25	II. *Oc. R.	8 5	I. Tr. E.	20 16	II. *Tr. E.		
8 2 56	I. Sh. I.						
3 25 38	IV. Ec. D.	16 1 56 23	I. Ec. D.	24 1 12	I. Sh. I.		
4 3	I. Tr. I.	5 13	I. Oc. R.	2 4	I. Tr. I.		
4 18 3	IV. Ec. R.	12 51	IV. Sh. I.	3 26	I. Sh. E.		
5 10	I. Sh. E.	13 12	II. Sh. I.	4 19	I. Tr. E.		
6 17	I. Tr. E.	14 9	IV. *Sh. E.	16 41 11	III. *Ec. D.		
13 42	IV. Oc. D.	15 14	II. *Tr. I.	19 47 29	III. *Ec. R.		
15 42	IV. *Oc. R.	15 51	II. *Sh. E.	20 12	III. *Oc. D.		
		17 54	II. *Tr. E.	21 16 16	IV. *Ec. D.		
		21 53	IV. *Tr. I.	22 18 44	I. *Ec. D.		
		23 18	I. *Sh. I.	22 40 14	IV. *Ec. R.		
9 0 2 47	I. Ec. D.	23 59	IV. Tr. E.	23 24	III. *Oc. R.		

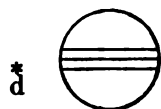
NOTE.—I. denotes Ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



III.



IV.



Configurations at 18^h 30^m for an Inverting Telescope.

West.

East.

	$\frac{4}{3}$	·1	○	2·	
4·		·3 2·	○ 1·		
4·		·2	○	·3	·1 ●
·4			1· ○	·2 ·3	
·4			○	$\frac{3}{1}$ 3·	
·4	2· 1·		○ 3·		
	3·4		○ 1·		·2 ●
3·	·1	○ 4	2·		
	·3 2·	○ 1·	·4		
	·2	1· ○ 3		·4	
		○	·2 ·3	·4	
		○	·12· 3·	·4	
	2· 1·	○ 3·		4·	
	3·	·2 ○	·1	4·	
3·	·1	○	$\frac{4}{2}$		
·3	$\frac{3}{1}$ ○	1·			
$\frac{4}{2}$	·1	○			·3 ●
4·		1· ○	·2 ·3		
4·		○ 1·	2· 3·		
4·	2· 1·	○	3·		
·4	3· 2·	○	·1		
·4 3·	1·	○	·2		
	·4 3	○	1·		
	·2	$\frac{1}{4}$ ○			·3 ●
		○ 1· 2· 4	·3		
		○	2· $\frac{3}{4}$		·1 ●
	2· 1·	○	3·	·4	
	$\frac{3}{2}$ ○	·1		·4	
3·	1·	○	·2	4·	
·3		○ 2·	1·	4·	

GREENWICH MEAN TIME.

DECEMBER.

d h m s		d h m s		d h m s		d h m s	
1 3 5	I. Sh. I.	9 6 11	III. Oc. R.	17 22 29 26	I.*Ec. D.	25 21 54	I.*Tr. I.
3 50	I. Tr. I.	16 3 25	II.*Ec. D.	18 1 8	I. Oc. R.	23 59	I. Sh. E.
5 20	I. Sh. E.	19 52	II.*Oc. R.	12 52	II.*Sh. I.	26 0 9	I. Tr. E.
6 4	I. Tr. E.	23 27	I.*Sh. I.	13 36	II.*Tr. I.	18 52 31	I.*Ec. D.
20 39 32	III.*Ec. D.	10 0 1	I. Tr. I.	15 34	II.*Sh. E.	21 18	I.*Oc. R.
3 0 12 40	I. Ec. D.	1 42	I. Sh. E.	16 18	II.*Tr. E.	22 51	III.*Sh. I.
2 49	III. Oc. R.	2 15	I. Tr. E.	19 50	I.*Sh. I.	23 26	III.*Tr. I.
3 13	I. Oc. R.	20 35 12	I.*Ec. D.	20 11	I.*Tr. I.		
13 28 43	II.*Ec. D.	23 24	I.*Oc. R.	22 4	I.*Sh. E.	27 2 1	III. Sh. E.
17 36	II.*Oc. R.	11 10 16	II. Sh. I.	22 25	I.*Tr. E.	2 36	III. Tr. E.
21 34	I.*Sh. I.	11 10 16	II. Tr. I.	19 16 58 5	I.*Ec. D.	10 30 0	II. Ec. D.
22 16	I.*Tr. I.	11 20	II.*Sh. E.	18 52	III.*Sh. I.	13 27	II.*Oc. R.
23 48	I. Sh. E.	12 58	II.*Tr. E.	19 34	I.*Oc. R.	16 12	I.*Sh. I.
3 0 31	I. Tr. E.	14 2	IV.*Ec. D.	20 11	III.*Tr. I.	16 20	I.*Tr. I.
6 43	IV. Sh. I.	15 11 22	IV.*Ec. R.	22 1	III.*Sh. E.	18 27	I.*Sh. E.
8 24	IV. Sh. E.	16 57 47	I.*Sh. I.	23 21	III.*Tr. E.	18 35	I.*Tr. E.
13 4	IV.*Tr. I.	17 56	I.*Tr. I.	30 0 38	IV. Sh. I.	23 9 8 47	IV. Ec. D.
15 13	IV.*Tr. E.	18 27	IV.*Oc. D.	2 37	IV. Sh. E.	12 19	IV.*Oc. R.
18 41 7	I.*Ec. D.	20 1	I.*Sh. E.	3 31	IV. Tr. I.	13 21 7	I.*Ec. D.
21 39	I.*Oc. R.	20 10	I.*Tr. E.	5 42	IV. Tr. E.	15 43	I.*Oc. R.
4 7 41	II. Sh. I.	20 41	IV.*Oc. R.	7 55 22	II. Ec. D.	29 4 47	II. Sh. I.
9 4	II. Tr. I.	22 10	III.*Sh. I.	11 14	II. Oc. R.	4 58	II. Tr. I.
10 21	II. Sh. E.	13 14 53	I.*Ec. D.	14 18	I.*Sh. I.	7 29	II. Sh. E.
11 45	II. Tr. E.	15 3 48	III.*Tr. I.	14 36	I.*Tr. I.	7 40	II. Tr. E.
16 2	I.*Sh. I.	16 53	I.*Oc. R.	16 33	I.*Sh. E.	10 41	I.*Sh. I.
16 42	I.*Tr. I.	17 50	III.*Sh. E.	16 51	I.*Tr. E.	10 46	I.*Tr. I.
18 17	I.*Sh. E.	18 1	III.*Tr. E.	21 11 26 39	I.*Ec. D.	12 56	I.*Sh. E.
18 57	I.*Tr. E.	20 4	II. Ec. D.	14 0	I.*Oc. R.	13 0	I.*Tr. E.
5 10 55	III. Sh. I.	13 5 20 46	II. Oc. R.	23 2 10	II. Sh. I.	30 7 49 47	I. Ec. D.
13 9 41	I.*Ec. D.	9 0	I.*Sh. I.	2 43	II. Tr. I.	10 9	I. Oc. R.
13 33	III.*Tr. I.	12 24	I.*Tr. I.	4 52	II. Sh. E.	12 37 0	III.*Ec. D.
14 1	III.*Sh. E.	12 53	I.*Sh. E.	5 25	II. Tr. E.	16 2	III.*Oc. R.
16 5	I.*Oc. R.	14 39	I.*Tr. E.	8 47	I. Sh. I.	23 47 19	II.*Ec. D.
16 44	III.*Tr. E.	15 8	I. Ec. D.	9 2	I. Tr. I.	31 2 33	II. Oc. R.
6 2 46 9	II. Ec. D.	14 9 32 20	I.*Oc. R.	11 1	I. Sh. E.	5 9	I. Sh. I.
6 45	II. Oc. R.	12 16	II.*Sh. I.	11 17	I.*Tr. E.	5 12	I. Tr. I.
10 31	I. Sh. I.	23 34	II. Tr. I.	23 5 55 17	I. Ec. D.	7 24	I. Sh. E.
11 9	I. Tr. I.	15 0 28	II. Sh. E.	8 26	I. Oc. R.	7 26	I. Tr. E.
12 45	I.*Sh. E.	2 16	II. Tr. E.	8 37 41	III. Ec. D.		
13 23	I.*Tr. E.	3 10	I. Sh. I.	12 47	III.*Oc. R.		
7 7 38 10	I. Ec. D.	6 53	I. Tr. I.	21 12 40	II.*Ec. D.		
10 30	I. Oc. R.	7 19	I. Sh. E.	24 0 21	II. Oc. R.		
20 58	II.*Sh. I.	9 7	I. Tr. E.	3 15	I. Sh. I.		
22 12	II.*Tr. I.	9 33	I. Ec. D.	3 28	I. Tr. I.		
23 39	II.*Sh. E.	16 4 0 56	I. Oc. R.	5 30	I. Sh. E.		
8 0 53	II. Tr. E.	4 37 45	III. Ec. D.	5 43	I. Tr. E.		
4 59	I. Sh. I.	6 42	I. Oc. R.	25 0 23 50	I. Ec. D.		
5 35	I. Tr. I.	9 29	III. Oc. R.	2 52	I. Oc. R.		
7 14	I. Sh. E.	18 38 3	II.*Ec. D.	15 29	II.*Sh. I.		
7 49	I. Tr. E.	22 7	II.*Oc. R.	15 51	II.*Tr. I.		
9 0 38 34	III. Ec. D.	17 1 21	I. Sh. I.	18 11	II.*Sh. E.		
2 6 44	I. Ec. D.	1 45	I. Tr. I.	18 33	II.*Tr. E.		
4 58	I. Oc. R.	3 36	I. Sh. E.	21 44	I.*Sh. I.		
		3 59	I. Tr. E.				

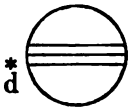
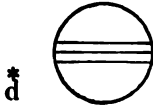
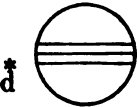
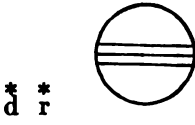
NOTE.—I. denotes Ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

	III.	
	IV.	

Configurations at 17^h 45^m for an Inverting Telescope.

West.	East.
2. 1.3	4.
	21. 4.3
	1. 2. 3
4. 2.	3.
4. 2. 3.	1.
4. 3. 1.	2.
4. 3.	2. 1.
4. 2. 1.3	
4.	1. 3. 2.
4. 1.	2. 3.
2. 1. 4.	3.
2. 1.	4.
3. 1.	2. 4.
3. 1.	4.
2. 1.3	4.
1. 2. 3. 4.	
2. 1. 3. 4.	
3. 4. 1. 2.	
4. 3. 1. 2.	
4. 2. 3. 1.	
4. 1. 2. 3.	
4. 2. 1. 3.	
3. 4. 1. 2.	
3. 2. 1. 4.	
2. 3. 1. 4.	
1. 2. 3. 4.	

660 . MAGNITUDE AND RINGS OF SATURN, 1918.

ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION, APPEARANCE,
AND MAGNITUDE OF SATURN'S RINGS.

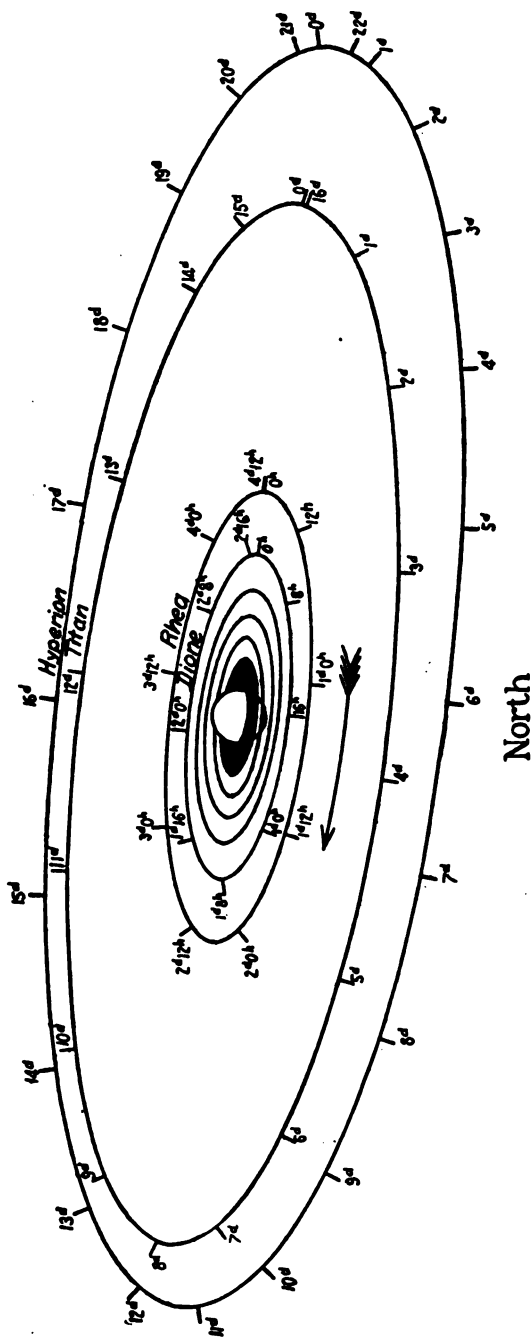
Greenwich Mean Midnight.	<i>a</i>	<i>b</i>	<i>P</i>	<i>B</i>	<i>U</i>	<i>ω</i>	<i>B'</i>	<i>U'</i>
	"	"	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "
Jan. 2	45.40	-12.87	-7 3.5	-16 26.4	10 54.7	42 21.7	-17 38.8	325 25.3
10	45.73	13.14	7 4.6	16 40.5	10 24.1	42 21.6	17 32.6	325 42.5
18	45.96	13.38	7 5.8	16 55.9	9 49.9	42 21.6	17 26.5	325 59.7
26	46.08	13.62	7 7.0	17 11.9	9 13.3	42 21.5	17 20.2	326 16.9
Feb. 3	46.08	13.85	7 8.2	17 28.1	8 35.8	42 21.5	17 14.0	326 34.1
11	45.98	-14.01	-7 9.4	-17 43.9	7 58.7	42 21.5	-17 7.7	326 51.3
19	45.76	14.13	7 10.4	17 58.6	7 23.5	42 21.5	17 1.5	327 8.4
27	45.45	14.20	7 11.2	18 11.8	6 51.2	42 21.4	16 55.3	327 25.5
Mar. 7	45.04	14.20	7 12.0	18 23.2	6 23.2	42 21.4	16 49.0	327 42.6
15	44.57	14.17	7 12.6	18 32.4	6 0.2	42 21.3	16 42.6	327 59.7
23	44.03	-14.08	-7 13.0	-18 39.1	5 43.2	42 21.3	-16 36.2	328 16.7
31	43.45	13.94	7 13.3	18 43.2	5 32.7	42 21.2	16 29.9	328 33.7
Apr. 8	42.85	13.76	7 13.4	18 44.7	5 28.8	42 21.2	16 23.5	328 50.7
16	42.23	13.55	7 13.3	18 43.4	5 31.7	42 21.1	16 17.1	329 7.7
24	41.61	13.31	7 13.0	18 39.5	5 41.4	42 21.1	16 10.7	329 24.6
May 2	41.01	-13.05	-7 12.6	-18 33.2	5 57.6	42 21.1	-16 4.2	329 41.5
10	40.41	12.76	7 12.0	18 24.4	6 20.0	42 21.1	15 57.7	329 58.4
18	39.86	12.46	7 11.3	18 13.3	6 48.2	42 21.0	15 51.2	330 15.3
26	39.35	12.16	7 10.4	17 59.9	7 21.8	42 21.0	15 44.8	330 32.1
June 3	38.88	11.85	7 9.2	17 44.6	8 0.1	42 20.9	15 38.3	330 48.9
11	38.45	-11.53	-7 8.0	-17 27.4	8 42.8	42 20.9	-15 31.7	331 5.7
19	38.06	11.21	7 6.5	17 8.5	9 29.3	42 20.9	15 25.1	331 22.5
27	37.73	10.90	7 4.8	16 48.1	10 19.0	42 20.9	15 18.5	331 39.3
July 5	37.45	10.59	7 2.9	16 26.3	11 11.3	42 20.8	15 11.9	331 56.0
13	37.22	10.30	7 0.9	16 3.5	12 5.8	42 20.8	15 5.3	332 12.7
21	37.05	-10.00	-6 58.8	-15 39.8	13 1.9	42 20.7	-14 58.7	332 29.4
29	36.94	9.72	6 56.5	15 15.4	13 59.1	42 20.7	14 52.0	332 46.0
Aug. 6	36.88	9.44	6 53.9	14 50.3	14 56.8	42 20.6	14 45.4	333 2.6
14	36.87	9.18	6 51.4	14 25.1	15 54.7	42 20.6	14 38.6	333 19.2
22	36.92	8.93	6 48.7	13 59.8	16 52.2	42 20.5	14 31.9	333 35.8
30	37.03	- 8.69	-6 46.0	-13 34.6	17 48.9	42 20.5	-14 25.2	333 52.4
Sept. 7	37.19	8.47	6 43.2	13 10.0	18 44.2	42 20.5	14 18.5	334 8.9
15	37.40	8.27	6 40.6	12 46.1	19 37.5	42 20.5	14 11.8	334 25.4
23	37.67	8.08	6 37.9	12 23.3	20 28.5	42 20.4	14 5.0	334 41.9
Oct. 1	38.00	7.92	6 35.2	12 1.6	21 16.5	42 20.4	13 58.2	334 58.4
9	38.38	- 7.78	-6 32.7	-11 41.5	22 1.2	42 20.3	-13 51.4	335 14.8
17	38.81	7.66	6 30.3	11 23.3	22 42.0	42 20.3	13 44.6	335 31.2
25	39.28	7.57	6 28.3	11 7.1	23 18.3	42 20.3	13 37.8	335 47.6
Nov. 2	39.80	7.52	6 26.4	10 53.5	23 49.8	42 20.3	13 31.0	336 4.0
10	40.35	7.50	6 24.9	10 42.5	24 16.0	42 20.2	13 24.1	336 20.4
18	40.92	- 7.51	-6 23.6	-10 34.3	24 36.5	42 20.2	-13 17.3	336 36.7
26	41.52	7.56	6 22.8	10 29.1	24 50.8	42 20.1	13 10.4	336 53.0
Dec. 4	42.13	7.65	6 22.4	10 27.1	24 58.7	42 20.1	13 3.5	337 9.3
12	42.73	7.77	6 22.3	10 28.4	25 0.2	42 20.0	12 56.6	337 25.5
20	43.32	7.92	6 22.7	10 32.8	24 55.1	42 20.0	12 49.7	337 41.8
28	43.87	- 8.11	-6 23.4	-10 40.3	24 43.9	42 20.0	-12 42.8	337 58.0

The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring—0.8801,	log factor—9.9445
The outer ellipse of the inner ring—0.8599,	log factor—9.9344
The inner ellipse of the inner ring—0.6650,	log factor—9.8228
The inner ellipse of the dusky ring—0.5486,	log factor—9.7392

NOTE.—The negative sign of *B* indicates that the visible surface of the rings is the southern one.

South



NAMES OF THE SATELLITES.

- I. Mimas.
- II. Enceladus.
- III. Tethys.
- IV. Dione.
- V. Rhea.
- VI. Titan.
- VII. Hyperion.
- VIII. Iapetus.
- IX. Phoebe.

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,
AT DATE OF OPPOSITION, JANUARY 31, 1918,
AS SEEN IN AN INVERTING TELESCOPE.

MEAN SYNODIC PERIODS.

	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.6
VIII.	79	22.1
IX.	523	15.6

GREENWICH MEAN TIME.

In the diagram on the preceding page, the points of the orbits marked "0" are those of the eastern elongation, as seen in an inverting telescope. The times of these elongations may be found from the following tables, and the apparent position of a satellite at any other time may be marked on the diagram by setting off on the proper orbit the elapsed interval in days and hours since the last eastern elongation. The orbits of the five inner satellites are regarded as circular, and the time of any greatest elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the mean synodic period. For Titan, Hyperion, and Iapetus the eccentricity is taken into account, and for Iapetus the times both of the greatest elongations and of the conjunctions are given. The following abbreviations are used in the tables:

E., Eastern Elongation.
W., Western Elongation.

I., Inferior Conjunction (north of planet).
S., Superior Conjunction (south of planet).

MIMAS.

Greatest Elongations Visible in the United States.

Jan.	d h	Jan.	d h	Feb.	d h	Apr.	d h	May	d h	Nov.	d h
1	1.8 W.	29	19.5 E.	28	0.5 E.	4	20.0 E.	25	17.6 E.	27	21.7 W.
1	13.1 E.	30	18.1 E.	28	11.9 W.	5	18.6 E.	26	16.2 E.	28	20.4 W.
2	0.4 W.	31	16.7 E.	28	23.2 E.	6	17.2 E.	27	14.8 E.	29	19.0 W.
2	23.0 W.	Feb.	1 15.3 E.	Mar.	1 21.8 E.	7	15.8 E.	28	13.4 E.	30	17.6 W.
3	21.7 W.		2 13.9 E.		2 20.4 E.	8	14.4 E.	...	...	Dec.	1 16.2 W.
4	20.3 W.		3 1.2 W.		3 19.0 E.	9	13.1 E.		...		3 2.1 E.
5	18.9 W.		3 12.5 E.		4 17.6 E.	11	21.6 W.	Oct.	16 0.5 E.		4 0.7 E.
6	17.5 W.		3 23.9 W.		5 16.2 E.	12	20.3 W.		16 23.2 E.		4 23.3 E.
7	16.1 W.		4 11.2 E.		6 14.8 E.	13	18.9 W.		17 21.8 E.		5 22.0 E.
8	14.7 W.		4 22.5 W.		7 13.4 E.	14	17.5 W.		18 20.4 E.		6 20.6 E.
9	2.0 E.		5 21.1 W.		8 12.1 E.	15	16.1 W.		19 19.0 E.		7 19.2 E.
9	13.3 W.		6 19.7 W.		8 23.4 W.	16	14.7 W.		24 0.8 W.		8 17.8 E.
10	0.6 E.		7 18.3 W.		9 22.0 W.	17	13.4 W.		24 23.5 W.		9 16.5 E.
10	23.3 E.		8 16.9 W.		10 20.6 W.	20	20.5 E.		25 22.1 W.		11 2.4 W.
11	21.9 E.		9 15.5 W.		11 19.2 W.	21	19.1 E.		26 20.7 W.		12 1.0 W.
12	20.5 E.		10 14.1 W.		12 17.9 W.	22	17.7 E.		27 19.3 W.		12 23.6 W.
13	19.1 E.		11 1.4 E.		13 16.5 W.	23	16.4 E.	Nov.	1 1.1 E.		13 22.2 W.
14	17.7 E.		11 12.8 W.		14 15.1 W.	24	15.0 E.		1 23.7 E.		14 20.9 W.
15	16.3 E.		12 0.1 E.		15 13.7 W.	25	13.6 E.		2 22.3 E.		15 19.5 W.
16	14.9 E.		12 11.4 W.		16 12.3 W.	28	20.8 W.		3 21.0 E.		16 18.1 W.
17	2.2 W.		12 22.7 E.		16 23.7 E.	29	19.4 W.		4 19.6 E.		17 16.7 W.
17	13.5 E.		13 21.3 E.		17 22.3 E.	30	18.1 W.		5 18.2 E.		18 15.3 W.
18	0.8 W.		14 19.9 E.		18 20.9 E.	May	1 16.7 W.		9 1.4 W.		19 2.6 E.
18	12.1 E.		15 18.5 E.		19 19.5 E.	2	15.3 W.		10 0.0 W.		20 1.2 E.
18	23.4 W.		16 17.1 E.		20 18.1 E.	3	13.9 W.		10 22.6 W.		20 23.8 E.
19	22.1 W.		17 15.7 E.		21 16.7 E.		4 12.6 W.		11 21.2 W.		21 22.5 E.
20	20.7 W.		18 14.3 E.		22 15.3 E.		7 19.7 E.		12 19.9 W.		22 21.1 E.
21	19.3 W.		19 12.9 E.		23 13.9 E.		8 18.3 E.		13 18.5 W.		23 19.7 E.
22	17.9 W.		20 0.3 W.		24 12.6 E.		9 17.0 E.		17 1.6 E.		24 18.3 E.
23	16.5 W.		20 11.6 E.		25 22.5 W.		10 15.6 E.		18 0.2 E.		25 16.9 E.
24	15.1 W.		20 22.9 W.		26 21.1 W.		11 14.2 E.		18 22.8 E.		26 15.5 E.
25	2.4 E.		21 21.5 W.		27 19.7 W.		12 12.8 E.		19 21.5 E.		28 1.4 W.
25	13.7 W.		22 20.1 W.		28 18.4 W.		16 18.7 W.		20 20.1 E.		29 0.0 W.
26	1.0 E.		23 18.8 W.		29 17.0 W.		17 17.3 W.		21 18.7 E.		29 22.7 W.
26	12.3 W.		24 17.4 W.		30 15.6 W.		18 15.9 W.		22 17.3 E.		30 21.3 W.
26	23.7 E.		25 16.0 W.		31 14.2 W.		19 14.5 W.		25 1.9 W.		31 19.9 W.
27	22.3 E.		26 14.6 W.	Apr.	1 12.8 W.		20 13.2 W.		26 0.5 W.		
28	20.9 E.		27 13.2 W.		3 21.4 E.		24 18.9 E.		26 23.1 W.		

SATELLITES OF SATURN, 1918.

663

GREENWICH MEAN TIME.

ENCELADUS.

a.	d h	Feb.	d h	Mar.	d h	May	d h	Oct.	d h	Nov.	d h
	1 20.8 E.		10 14.3 E.		22 7.9 E.		1 1.6 E.		18 1.0 E.		26 18.7 E.
	3 5.7 E.		11 23.2 E.		23 16.8 E.		2 10.5 E.		19 9.9 E.		28 3.6 E.
	4 14.6 E.		13 8.0 E.		25 1.6 E.		3 19.4 E.		20 18.8 E.		29 12.5 E.
	5 23.5 E.		14 16.9 E.		26 10.5 E.		5 4.3 E.		22 3.7 E.		30 21.4 E.
	7 8.3 E.		16 1.8 E.		27 19.4 E.		6 13.2 E.		23 12.6 E.	Dec.	2 6.3 E.
	8 17.2 E.		17 10.7 E.		29 4.3 E.		7 22.1 E.		24 21.4 E.		3 15.2 E.
	10 2.1 E.		18 19.6 E.		30 13.2 E.		9 7.0 E.		26 6.3 E.		5 0.1 E.
	11 11.0 E.		20 4.5 E.		31 22.1 E.		10 15.9 E.		27 15.2 E.		6 8.9 E.
	12 19.9 E.		21 13.3 E.	Apr.	2 6.9 E.		12 0.8 E.		29 0.1 E.		7 17.8 E.
	14 4.8 E.		22 22.2 E.		3 15.8 E.		13 9.7 E.		30 9.0 E.		9 2.7 E.
	15 13.7 E.		24 7.1 E.		5 0.7 E.		14 18.6 E.		31 17.9 E.		10 11.6 E.
	16 22.6 E.		25 16.0 E.		6 9.6 E.		16 3.4 E.	Nov.	2 2.8 E.		11 20.5 E.
	18 7.4 E.		27 0.9 E.		7 18.5 E.		17 12.3 E.		3 11.7 E.		13 5.4 E.
	19 16.3 E.		28 9.8 E.		9 3.4 E.		18 21.2 E.		4 20.6 E.		14 14.2 E.
	21 1.2 E.	Mar.	1 18.6 E.		10 12.3 E.		20 6.1 E.		6 5.5 E.		15 23.1 E.
	22 10.1 E.		3 3.5 E.		11 21.2 E.		21 15.0 E.		7 14.4 E.		17 8.0 E.
	23 19.0 E.		4 12.4 E.		13 6.1 E.		22 23.9 E.		8 23.2 E.		18 16.9 E.
	25 3.9 E.		5 21.3 E.		14 14.9 E.		24 8.8 E.		10 8.1 E.		20 1.8 E.
	26 12.8 E.		7 6.2 E.		15 23.8 E.		25 17.7 E.		11 17.0 E.		21 10.7 E.
	27 21.7 E.		8 15.0 E.		17 8.7 E.		27 2.6 E.		13 1.9 E.		22 19.5 E.
	29 6.5 E.		9 23.9 E.		18 17.6 E.		28 11.5 E.		14 10.8 E.		24 4.4 E.
	30 15.3 E.		11 8.8 E.		20 2.5 E.		29 20.4 E.		15 19.6 E.		25 13.3 E.
b.	1 0.2 E.		12 17.7 E.		21 11.4 E.		31 5.3 E.		17 4.5 E.		26 22.2 E.
	2 9.0 E.		14 2.6 E.		22 20.3 E.	June	1 14.2 E.		18 13.4 E.		28 7.1 E.
	3 17.9 E.		15 11.5 E.		24 5.2 E.		...		19 22.3 E.		29 16.0 E.
	5 2.8 E.		16 20.3 E.		25 14.1 E.		...		21 7.2 E.		31 0.8 E.
	6 11.7 E.		18 5.2 E.		26 23.0 E.	Oct.	13 22.3 E.		22 16.1 E.		
	7 20.5 E.		19 14.1 E.		28 7.9 E.		15 7.2 E.		24 0.9 E.		
	9 5.4 E.		20 23.0 E.		29 16.8 E.		16 16.1 E.		25 9.8 E.		

TETHYS.

a.	d h	Feb.	d h	Mar.	d h	May	d h	Oct.	d h	Nov.	d h
	2 11.7 E.		11 2.7 E.		22 18.0 E.		1 9.5 E.		18 9.4 E.		27 1.0 E.
	4 9.0 E.		13 0.0 E.		24 15.3 E.		3 6.8 E.		20 6.7 E.		28 22.3 E.
	6 6.3 E.		14 21.3 E.		26 12.6 E.		5 4.2 E.		22 4.0 E.		30 19.6 E.
	8 3.5 E.		16 18.6 E.		28 9.9 E.		7 1.5 E.		24 1.3 E.	Dec.	2 16.9 E.
	10 0.8 E.		18 15.9 E.		30 7.2 E.		8 22.8 E.		25 22.6 E.		4 14.2 E.
	11 22.1 E.		20 13.2 E.	Apr.	1 4.5 E.		10 20.1 E.		27 20.0 E.		6 11.5 E.
	13 19.4 E.		22 10.5 E.		3 1.8 E.		12 17.5 E.		29 17.3 E.		8 8.8 E.
	15 16.7 E.		24 7.8 E.		4 23.1 E.		14 14.8 E.		31 14.6 E.		10 6.1 E.
	17 14.0 E.		26 5.1 E.		6 20.4 E.		16 12.1 E.	Nov.	2 11.9 E.		12 3.4 E.
	19 11.3 E.		28 2.4 E.		8 17.7 E.		18 9.4 E.		4 9.3 E.		14 0.7 E.
	21 8.6 E.	Mar.	1 23.7 E.		10 15.0 E.		20 6.8 E.		6 6.6 E.		15 22.0 E.
	23 5.9 E.		3 21.0 E.		12 12.3 E.		22 4.1 E.		8 3.9 E.		17 19.4 E.
	25 3.1 E.		5 18.3 E.		14 9.7 E.		24 1.4 E.		10 1.2 E.		19 16.7 E.
	27 0.4 E.		7 15.6 E.		16 7.0 E.		25 22.7 E.		11 22.6 E.		21 14.0 E.
	28 21.7 E.		9 12.9 E.		18 4.3 E.		27 20.1 E.		13 19.9 E.		23 11.3 E.
	30 19.0 E.		11 10.2 E.		20 1.6 E.		29 17.4 E.		15 17.2 E.		25 8.6 E.
b.	1 16.3 E.		13 7.5 E.		21 22.9 E.		31 14.7 E.		17 14.5 E.		27 5.9 E.
	3 13.6 E.		15 4.8 E.		23 20.2 E.		...		19 11.8 E.		29 3.2 E.
	5 10.9 E.		17 2.1 E.		25 17.6 E.		...		21 9.1 E.		31 0.5 E.
	7 8.2 E.		18 23.4 E.		27 14.9 E.	Oct.	14 14.7 E.		23 6.4 E.		
	9 5.4 E.		20 20.7 E.		29 12.2 E.		16 12.0 E.		25 3.7 E.		

GREENWICH MEAN TIME.

DIONE.

Jan.	d h	Feb.	d h	Mar.	d h	May	d h	Oct.	d h	Dec.	d h
	3 2.9 E.		13 3.7 E.		26 4.7 E.		6 6.1 E.		23 1.7 E.		3 3.3 E.
	520.6 E.		1521.3 E.		2822.3 E.		823.8 E.		2519.5 E.		521.0 E.
	814.2 E.		1814.9 E.		3116.0 E.		1117.5 E.		2813.2 E.		814.7 E.
	11 7.9 E.		21 8.6 E.	Apr.	3 9.6 E.		1411.2 E.		31 6.9 E.		11 8.3 E.
	14 1.5 E.		24 2.2 E.		6 3.3 E.		17 5.0 E.	Nov.	3 0.6 E.		14 2.0 E.
	1619.2 E.		2619.9 E.		821.0 E.		1922.7 E.		518.3 E.		1619.7 E.
	1912.8 E.	Mar.	113.5 E.		1114.7 E.		2216.4 E.		812.0 E.		1913.4 E.
	22 6.5 E.		4 7.2 E.		14 8.4 E.		2510.1 E.		11 5.7 E.		22 7.1 E.
	25 0.1 E.		7 0.9 E.		17 2.1 E.		28 3.8 E.		1323.4 E.		25 0.7 E.
	2717.8 E.		918.6 E.		1919.8 E.		3021.6 E.		1617.1 E.		2718.4 E.
	3011.4 E.		1212.3 E.		2213.5 E.		.....		1910.8 E.		3012.0 E.
Feb.	2 5.1 E.		15 5.9 E.		25 7.2 E.		.....		22 4.5 E.		.....
	422.7 E.		1723.6 E.		28 0.9 E.	Oct.	1420.6 E.		2422.2 E.		.....
	716.4 E.		2017.3 E.		3018.6 E.		1714.3 E.		2715.9 E.		.....
	1010.0 E.		2311.0 E.	May	312.4 E.		20 8.0 E.		30 9.6 E.		.....

RHEA.

Jan.	d h	Feb.	d h	Mar.	d h	May	d h	Oct.	d h	Dec.	d h
	5 2.4 E.		1417.3 E.		27 8.5 E.		7 0.5 E.		21 9.2 E.		1 1.4 E.
	914.8 E.		19 5.7 E.		3120.9 E.		1113.0 E.		2521.7 E.		513.9 E.
	14 3.1 E.		2318.0 E.	Apr.	5 9.3 E.		16 1.5 E.		3010.2 E.		10 2.3 E.
	1815.4 E.		28 6.3 E.		921.7 E.		2014.0 E.	Nov.	322.7 E.		1414.7 E.
	23 3.7 E.	Mar.	418.6 E.		1410.2 E.		25 2.6 E.		811.2 E.		19 3.1 E.
	2716.0 E.		9 7.0 E.		1822.6 E.		2915.1 E.		1223.7 E.		2315.5 E.
Feb.	1 4.3 E.		1319.3 E.		2311.1 E.		.....		1712.1 E.		28 3.9 E.
	516.7 E.		18 7.7 E.		2723.5 E.		.....		22 0.6 E.		3216.3 E.
	10 5.0 E.		2220.1 E.	May	212.0 E.	Oct.	1620.7 E.		2613.0 E.		.....

TITAN.

Jan.	d h	Feb.	d h	Apr.	d h	May	d h	Oct.	d h	Dec.	d h
	110.1 W.		18 2.4 W.		620.3 W.		2418.4 W.		3123.4 W.		1820.7 W.
	915.1 E.		26 7.5 E.		15 2.2 E.	June	2 0.8 E.		9 4.6 E.		27 1.2 E.
	17 7.6 W.	Mar.	523.9 W.		2219.2 W.		.....		1622.9 W.		.....
	2512.6 E.		14 5.3 E.	May	1 1.3 E.		.....		25 3.9 E.		.....
Feb.	2 5.0 W.		2121.9 W.		818.6 W.	Oct.	1523.4 W.	Dec.	222.1 W.		.....
	1010.0 E.		30 3.5 E.		17 0.9 E.		24 4.9 E.		11 2.7 E.		.....

HYPERION.

Jan.	d h	Feb.	d h	Mar.	d h	May	d h	Oct.	d h	Nov.	d h
	3 4.9 E.		1418.6 E.		29 8.9 E.		11 2.1 E.		1815.2 W.		30 1.0 W.
	1414.9 W.		26 4.4 W.	Apr.	918.6 W.		2210.6 W.		29 1.8 E.		Dec.10 12.7 E.
	2411.9 E.	Mar.	8 1.4 E.		1917.1 E.	June	111.5 E.	Nov.	820.5 W.		21 4.8 W.
Feb.	421.7 W.		1911.3 W.	May	1 2.4 W.		.....		19 7.8 E.		3116.6 E.

IAPETUS.

Jan.	d h	Feb.	d h	Mar.	d h	May	d h	Nov.	d h	Dec.	d h
	418.2 W.		1318.6 E.		24 0.8 W.		316.9 E.		2 1.4 I.		11 5.8 E.
	24 6.2 S.	Mar.	5 8.9 I.	Apr.	1217.1 S.		2320.3 I.		21 2.5 W.		3123.7 E.

DIFFERENTIAL COORDINATES OF PHOEBE.

FOR GREENWICH MEAN NOON.

Date.	$\alpha_{Ph.} - \alpha_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$	Date.	$\alpha_{Ph.} - \alpha_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$	Date.	$\alpha_{Ph.} - \alpha_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$
	m s	' "		m s	' "		m s	' "
a. 0	-2 17.8	+8 11	Apr. 14	+0 10.2	-2 46	Sept. 21	+1 2.6	-3 15
2	2 16.7	8 2	16	0 13.9	2 58	23	1 0.3	3 2
4	2 15.5	7 52	18	0 17.5	3 9	25	0 58.0	2 49
6	2 14.2	7 42	20	0 21.1	3 20	27	0 55.6	2 35
8	2 12.8	7 32	22	0 24.7	3 31	29	0 53.2	2 22
10	-2 11.4	+7 21	24	+0 28.3	-3 42	Oct. 1	+0 50.8	-2 8
12	2 9.8	7 11	26	0 31.8	3 53	3	0 48.3	1 54
14	2 8.2	7 0	28	0 35.3	4 4	5	0 45.8	1 40
16	2 6.5	6 48	30	0 38.7	4 14	7	0 43.3	1 26
18	2 4.8	6 37	May 2	0 42.0	4 24	9	0 40.8	1 11
20	-2 2.9	+6 25	4	+0 45.3	-4 34	11	+0 38.2	-0 56
22	2 1.0	6 13	6	0 48.5	4 44	13	0 35.6	0 42
24	1 59.0	6 1	8	0 51.7	4 53	15	0 33.0	0 27
26	1 56.9	5 48	10	0 54.8	5 2	17	0 30.4	-0 12
28	1 54.8	5 36	12	0 57.8	5 11	19	0 27.8	+0 4
b. 30	-1 52.5	+5 23	14	+1 0.8	-5 20	21	+0 25.1	+0 19
1	1 50.2	5 10	16	1 3.7	5 29	23	0 22.4	0 34
3	1 47.8	4 57	18	1 6.5	5 37	25	0 19.7	0 50
5	1 45.3	4 44	20	1 9.2	5 45	27	0 17.0	1 6
7	1 42.8	4 30	22	1 11.9	5 53	29	0 14.3	1 21
9	-1 40.2	+4 17	24	+1 14.4	-6 1	Nov. 31	+0 11.6	+1 37
11	1 37.5	4 3	26	1 16.9	6 8	2	0 8.9	1 53
13	1 34.7	3 50	28	1 19.3	6 15	4	0 6.1	2 8
15	1 31.8	3 36	30	1 21.6	6 22	6	0 3.4	2 24
17	1 28.9	3 22	June 1	1 23.8	6 28	8	+0 0.6	2 40
19	-1 26.0	+3 8	3	+1 25.9	-6 34	10	-0 2.2	+2 56
21	1 22.9	2 55	5	1 27.9	6 40	12	0 4.9	3 12
23	1 19.8	2 41	7	1 29.8	6 46	14	0 7.7	3 28
25	1 16.6	2 27	9	1 31.6	6 51	16	0 10.5	3 44
27	1 13.4	2 13	11	1 33.3	6 56	18	0 13.2	3 59
r. 1	-1 10.1	+1 59	13	+1 34.9	-7 1	20	-0 16.0	+4 15
3	1 6.8	1 46	15	1 36.5	7 5	22	0 18.7	4 30
5	1 3.4	1 32	17	1 37.9	7 9	24	0 21.5	4 46
7	1 0.0	1 18	19	1 39.2	7 12	26	0 24.2	5 2
9	0 56.5	1 4	21	1 40.4	7 16	28	0 27.0	5 17
11	-0 53.0	+0 51	23	+1 41.5	-7 19	Dec. 30	-0 29.7	+5 32
13	0 49.4	0 37	25	1 42.5	7 21	2	0 32.4	5 47
15	0 45.8	0 24	27	1 43.4	7 23	4	0 35.2	6 2
17	0 42.1	+0 10	29	1 44.2	7 25	6	0 37.9	6 17
19	0 38.5	-0 3	July 1	1 44.9	7 27	8	0 40.6	6 32
21	-0 34.8	-0 16	3	+1 45.5	-7 28	10	-0 43.2	+6 46
23	0 31.1	0 29	5	1 46.0	7 29	12	0 45.9	7 0
25	0 27.3	0 42	7	1 46.4	7 29	14	0 48.5	7 14
27	0 23.6	0 55	9	1 46.7	7 29	16	0 51.2	7 28
29	0 19.8	1 8	11	+1 47.0	-7 29	18	0 53.8	7 42
31	-0 16.1	-1 21		....	...	20	-0 56.4	+7 56
r. 2	0 12.3	1 34		....	...	22	0 58.9	8 9
4	0 8.5	1 46	Sept. 11	+1 13.5	-4 15	24	1 1.5	8 22
6	0 4.8	1 58	13	1 11.4	4 4	26	1 4.0	8 34
8	-0 1.0	2 10	15	1 9.3	3 52	28	1 6.5	8 47
10	+0 2.7	-2 22	17	+1 7.1	-3 40	30	-1 9.0	+8 59
12	+0 6.5	-2 34	19	+1 4.9	-3 27	32	-1 11.5	+9 11

Time from Eastern Elongation.	Mimas.		Time from Eastern Elongation.	Enceladus.		Tethys.		Time from Eastern Elongation.	Dione.	
	p^1	F		p^1	F	p^1	F		p^1	F
h	.		d h	.		.		d h	.	
0.0	83.0	1.000	0 0	83.0	1.000	83.0	1.000	0 0	83.0	1.000
0.5	80.6	0.991	0 1	79.7	0.983	80.5	0.991	0 2	79.7	0.983
1.0	78.2	0.965	0 2	76.2	0.935	77.9	0.966	0 4	76.2	0.934
1.5	75.6	0.922	0 3	72.1	0.856	75.2	0.923	0 6	72.1	0.855
2.0	72.7	0.864	0 4	67.0	0.751	72.1	0.866	0 8	67.0	0.750
2.5	69.2	0.791	0 5	60.1	0.627	68.5	0.794	0 10	60.1	0.626
3.0	65.1	0.707	0 6	49.5	0.494	64.1	0.712	0 12	49.5	0.492
3.5	59.7	0.614	0 7	31.5	0.371	58.6	0.620	0 14	31.4	0.370
4.0	52.3	0.516	0 8	1.1	0.301	51.0	0.525	0 16	0.7	0.300
4.5	41.5	0.421	0 9	326.4	0.331	40.1	0.433	0 18	325.9	0.331
5.0	25.0	0.341	0 10	303.2	0.436	23.9	0.356	0 20	302.9	0.437
5.5	1.3	0.297	0 11	290.0	0.568	1.3	0.314	0 22	289.7	0.570
6.0	334.9	0.308	0 12	281.7	0.698	336.2	0.323	1 0	281.6	0.700
6.5	313.8	0.369	0 13	276.0	0.812	315.8	0.380	1 2	275.9	0.814
7.0	299.8	0.456	0 14	271.6	0.903	301.7	0.464	1 4	271.5	0.904
7.5	290.6	0.553	0 15	267.8	0.966	292.1	0.558	1 6	267.7	0.966
8.0	284.1	0.649	0 16	264.5	0.997	285.3	0.653	1 8	264.4	0.997
8.5	279.2	0.740	0 17	261.2	0.995	280.2	0.741	1 10	261.1	0.994
9.0	275.4	0.820	0 18	257.8	0.960	276.2	0.821	1 12	257.7	0.959
9.5	272.2	0.888	0 19	254.0	0.894	272.8	0.887	1 14	253.9	0.892
10.0	269.4	0.940	0 20	249.4	0.800	269.8	0.940	1 16	249.3	0.797
10.5	266.8	0.977	0 21	243.5	0.684	267.2	0.976	1 18	243.3	0.680
11.0	264.4	0.996	0 22	234.8	0.553	264.6	0.996	1 20	234.6	0.549
11.5	262.1	0.999	0 23	220.8	0.422	262.1	0.999	1 22	220.3	0.418
12.0	259.7	0.983	1 0	196.1	0.322	259.6	0.984	2 0	195.2	0.319
12.5	257.2	0.951	1 1	160.9	0.305	257.0	0.953	2 2	159.7	0.305
13.0	254.5	0.902	1 2	131.9	0.384	254.2	0.905	2 4	131.0	0.387
13.5	251.4	0.838	1 3	115.0	0.509	250.9	0.843	2 6	114.5	0.513
14.0	247.8	0.760	1 4	105.0	0.642	247.1	0.767	2 8	104.6	0.646
14.5	243.2	0.672	1 5	98.3	0.764	242.4	0.681	2 10	98.1	0.768
15.0	237.2	0.576	1 6	93.4	0.866	236.2	0.588	2 12	93.2	0.869
15.5	228.7	0.479	1 7	89.4	0.942	227.7	0.492	2 14	89.3	0.944
16.0	216.0	0.388	1 8	85.9	0.987	215.2	0.404	2 16	85.8	0.988
16.5	196.7	0.318	1 9	82.6	1.000	196.7	0.337	2 18	82.5	1.000
17.0	171.0	0.294	1 10			172.5	0.311			
17.5	146.0	0.326	1 11			148.4	0.338			
18.0	127.8	0.400	1 12			130.2	0.407			
18.5	115.9	0.493	1 13			117.9	0.496			
19.0	107.8	0.591	1 14			109.5	0.591			
19.5	102.1	0.685	1 15			103.4	0.684			
20.0	97.7	0.772	1 16			98.7	0.770			
20.5	94.1	0.848	1 17			94.9	0.845			
21.0	91.1	0.910	1 18			91.7	0.907			
21.5	88.4	0.956	1 19			88.9	0.954			
22.0	85.9	0.986	1 20			86.3	0.985			
22.5	83.6	0.997	1 21			83.7	0.999			
23.0	81.2	0.995	1 22			81.3	0.996			

Position angle of satellite $p = p^1 + (P - P_0)$.Apparent distance of satellite $s = \frac{F^2(p)}{\rho}$.

Time from Eastern elongation.	Rhea.		Time from Eastern Elongation.	Titan.		Hyperion.		Time from Eastern Elongation.	Iapetus.	
	p^1	F		p^1	F	p^1	F		p^1	F
h	"		d h	"		"		d	"	
0	83.0	1.000	0 0	83.0	0.988	83.0	1.062	0	88.0	1.021
3	79.9	0.986	0 10	80.1	0.971	81.1	1.063	2	87.4	1.006
6	76.7	0.946	0 20	77.0	0.929	79.2	1.052	4	86.7	0.967
9	73.1	0.880	1 6	73.6	0.864	77.2	1.029	6	86.0	0.905
12	68.8	0.792	1 16	69.4	0.777	75.2	0.996	8	85.1	0.821
15	63.2	0.686	2 2	64.1	0.673	72.9	0.953	10	84.1	0.717
18	55.5	0.568	2 12	56.7	0.557	70.4	0.899	12	82.6	0.595
21	43.6	0.448	2 22	45.3	0.439	67.6	0.837	14	80.3	0.460
0	23.9	0.348	3 8	26.3	0.338	64.3	0.768	16	75.8	0.313
3	354.2	0.304	3 18	356.6	0.289	60.3	0.693	18	63.4	0.164
6	323.8	0.343	4 4	325.3	0.322	55.2	0.614	20	348.1	0.070
9	303.5	0.441	4 14	304.2	0.417	48.7	0.533	22	289.4	0.185
12	291.2	0.559	5 0	291.6	0.533	39.9	0.456	24	279.1	0.335
15	283.2	0.678	5 10	283.6	0.651	27.9	0.389	26	275.1	0.480
18	277.6	0.785	5 20	278.0	0.760	11.4	0.340	28	273.0	0.612
21	273.2	0.875	6 6	273.7	0.853	351.5	0.322	30	271.6	0.729
0	269.5	0.942	6 16	270.2	0.926	331.6	0.340	32	270.5	0.826
3	266.3	0.984	7 2	267.2	0.978	315.3	0.389	34	269.7	0.901
6	263.2	1.000	7 12	264.3	1.006	303.2	0.456	36	268.9	0.951
9	260.2	0.988	7 22	261.6	1.010	294.4	0.532	38	268.2	0.976
12	257.0	0.950	8 8	258.8	0.991	287.8	0.610	40	267.6	0.975
15	253.4	0.886	8 18	255.9	0.948	282.7	0.685	42	266.9	0.948
18	249.1	0.799	9 4	252.6	0.884	278.6	0.754	44	266.1	0.896
21	243.7	0.694	9 14	248.7	0.801	275.1	0.814	46	265.3	0.822
0	236.1	0.576	10 0	243.7	0.703	272.2	0.864	48	264.2	0.726
3	224.6	0.456	10 10	237.1	0.595	269.3	0.901	50	262.8	0.612
6	205.7	0.354	10 20	227.4	0.484	266.8	0.924	52	260.6	0.484
9	176.4	0.304	11 6	212.3	0.382	264.3	0.933	54	256.8	0.345
12	145.7	0.338	11 16	188.5	0.315	261.8	0.926	56	247.7	0.202
15	124.6	0.433	12 2	159.0	0.312	259.3	0.904	58	204.1	0.080
18	111.9	0.551	12 12	134.6	0.376	256.6	0.867	60	118.7	0.140
21	103.7	0.670	12 22	118.9	0.476	253.6	0.814	62	102.3	0.281
0	97.9	0.778	13 8	109.0	0.587	250.1	0.749	64	97.0	0.424
3	93.5	0.869	13 18	102.2	0.695	245.8	0.672	66	94.3	0.558
6	89.8	0.938	14 4	97.1	0.792	240.4	0.587	68	92.6	0.680
9	86.5	0.982	14 14	93.1	0.873	233.1	0.497	70	91.4	0.787
12	83.4	1.000	15 0	89.7	0.934	222.6	0.409	72	90.5	0.876
15	80.4	0.990	15 10	86.7	0.973	206.8	0.334	74	89.7	0.946
			15 20	83.8	0.988	184.5	0.291	76	89.0	0.993
			16 6	80.9	0.978	158.8	0.296	78	88.4	1.017
			16 16			137.6	0.349	80	87.8	1.019
			17 2			123.2	0.428			
			17 12			113.6	0.518			
			17 22			106.8	0.611			
			18 8			101.9	0.700			
			18 18			98.0	0.782			
			19 4			94.8	0.856			
			19 14			92.1	0.919			
			20 0			89.7	0.972			
			20 10			87.5	1.014			
			20 20			85.5	1.042			
			21 6			83.6	1.059			
			21 16			81.7	1.064			

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = \frac{r^2(p)}{p}$.

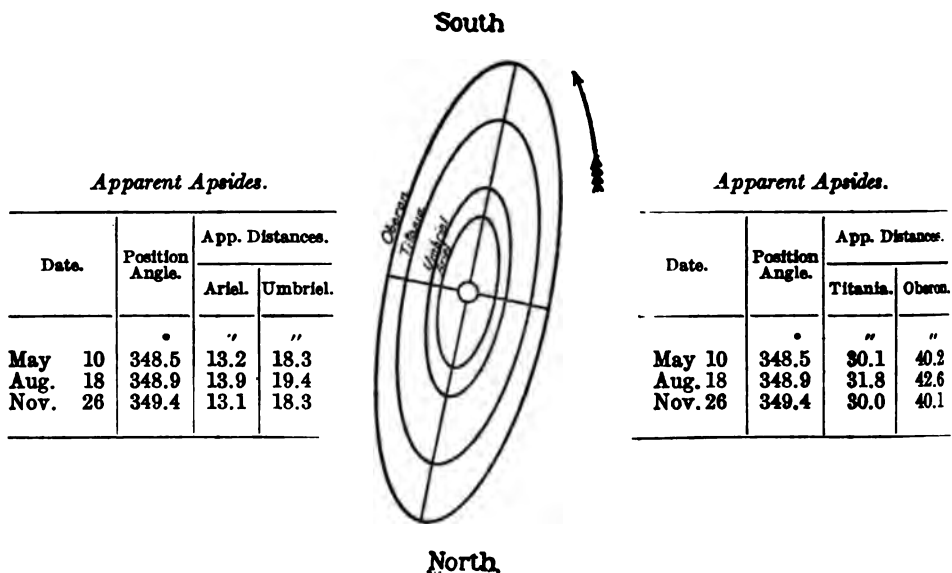
FOR GREENWICH MEAN MIDNIGHT.

Date.	Mimas.		Enceladus.		Tethys.		Dione.	
	$P - P_0$	$\frac{\alpha(\rho)}{\rho}$	$P - P_0$	$\frac{\alpha(\rho)}{\rho}$	$P - P_0$	$\frac{\alpha(\rho)}{\rho}$	$P - P_0$	$\frac{\alpha(\rho)}{\rho}$
	"	"	"	"	"	"	"	"
Jan. 1	+1.4	30.9	0.0	39.7	-0.8	49.1	-0.1	62.9
6	1.4	31.0	-0.1	39.9	0.8	49.3	0.1	63.2
11	1.5	31.1	0.1	40.0	0.8	49.5	0.1	63.4
16	1.5	31.3	0.1	40.1	0.8	49.7	0.2	63.6
21	1.5	31.4	0.1	40.2	0.9	49.8	0.2	63.8
26	+1.5	31.4	-0.1	40.3	-0.9	49.9	-0.2	63.9
31	1.5	31.4	0.1	40.3	0.9	49.9	0.2	63.9
Feb. 5	1.5	31.4	0.1	40.3	0.9	49.9	0.2	63.9
10	1.5	31.4	0.1	40.2	1.0	49.8	0.2	63.8
15	1.5	31.3	0.2	40.1	1.0	49.7	0.2	63.6
20	+1.5	31.2	-0.2	40.0	-1.0	49.5	-0.2	63.4
25	1.4	31.1	0.2	39.8	1.0	49.3	0.2	63.1
Mar. 2	1.4	30.9	0.2	39.6	1.0	49.1	0.3	62.8
7	1.3	30.7	0.2	39.4	1.1	48.8	0.3	62.4
12	1.2	30.5	0.2	39.1	1.1	48.5	0.3	62.0
17	+1.2	30.3	-0.2	38.9	-1.1	48.1	-0.3	61.6
22	1.1	30.0	0.2	38.6	1.1	47.7	0.3	61.1
27	1.0	29.8	0.2	38.2	1.1	47.3	0.3	60.6
Apr. 1	0.9	29.6	0.2	37.9	1.1	46.9	0.3	60.1
6	0.7	29.3	0.2	37.6	1.1	46.5	0.3	59.6
11	+0.6	29.1	-0.2	37.3	-1.2	46.1	-0.3	59.1
16	0.5	28.8	0.2	36.9	1.2	45.7	0.3	58.5
21	0.3	28.5	0.2	36.6	1.2	45.3	0.3	58.0
26	+0.2	28.2	0.2	36.2	1.2	44.9	0.3	57.5
May 1	0.0	28.0	0.2	35.9	1.2	44.5	0.3	56.9
6	-0.1	27.7	-0.2	35.6	-1.2	44.1	-0.3	56.4
11	0.2	27.5	0.2	35.3	1.2	43.7	0.3	55.9
16	0.4	27.3	0.2	35.0	1.2	43.3	0.2	55.4
21	0.5	27.0	0.2	34.7	1.2	42.9	0.2	55.0
26	-0.7	26.8	-0.2	34.4	-1.2	42.6	-0.2	54.6
Oct. 23	+0.6	26.7	+0.5	34.2	-0.5	42.4	+0.5	54.3
28	0.8	26.9	0.5	34.5	0.5	42.7	0.5	54.7
Nov. 2	1.0	27.1	0.5	34.8	0.4	43.1	0.5	55.1
7	1.1	27.4	0.6	35.1	0.4	43.4	0.6	55.6
12	+1.3	27.6	+0.6	35.4	-0.4	43.8	+0.6	56.1
17	1.4	27.8	0.6	35.7	0.3	44.2	0.6	56.6
22	1.6	28.1	0.6	36.0	0.3	44.6	0.6	57.1
27	1.7	28.4	0.6	36.4	0.3	45.0	0.6	57.7
Dec. 2	1.8	28.6	0.6	36.7	0.3	45.4	0.6	58.2
7	+1.9	28.9	+0.6	37.0	-0.3	45.8	+0.6	58.7
12	2.0	29.1	0.6	37.4	0.3	46.2	0.6	59.2
17	2.0	29.4	0.6	37.7	0.3	46.7	0.6	59.7
22	2.1	29.6	0.6	38.0	0.3	47.1	0.6	60.2
27	2.2	29.8	0.6	38.3	0.3	47.4	0.6	60.7
32	+2.2	30.1	+0.6	38.6	-0.3	47.8	+0.6	61.2

FOR GREENWICH MEAN MIDNIGHT.

Date.	Rhea.		Titan.		Hyperion.		Iapetus.	
	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
	"	"	"	"	"	"	"	"
n. 1	0.0	87.8	+0.3	204	+0.5	247	+0.6	593
6	-0.1	88.2	0.3	204	0.5	248	0.5	596
11	0.1	88.6	0.3	205	0.5	249	0.4	599
16	0.1	88.9	0.3	206	0.5	250	0.4	601
21	0.1	89.1	0.3	206	0.5	250	0.3	602
26	-0.1	89.2	+0.3	207	+0.5	251	+0.2	603
31	0.1	89.2	0.3	207	0.5	251	+0.1	603
b. 5	0.1	89.2	0.3	207	0.5	251	0.0	603
10	0.1	89.1	0.2	206	0.4	250	-0.1	602
15	0.1	88.8	0.2	206	0.4	250	0.2	600
20	-0.2	88.5	+0.2	205	+0.4	249	-0.3	598
25	0.2	88.2	0.2	204	0.4	248	0.4	596
kr. 2	0.2	87.7	0.2	203	0.4	246	0.5	593
7	0.2	87.2	0.2	202	0.4	245	0.6	589
12	0.2	86.6	0.2	201	0.4	243	0.6	585
17	-0.2	86.0	+0.2	199	+0.4	242	-0.7	581
22	0.2	85.4	0.2	198	0.4	240	0.7	577
27	0.2	84.7	0.2	196	0.4	238	0.8	572
pr. 1	0.2	84.0	0.2	195	0.4	236	0.8	567
6	0.2	83.2	0.2	193	0.4	234	0.8	562
11	-0.2	82.5	+0.2	191	+0.4	232	-0.8	557
16	0.2	81.8	0.2	190	0.4	230	0.8	552
21	0.2	81.0	0.2	188	0.4	228	0.8	547
26	0.2	80.3	0.2	186	0.4	225	0.7	542
ay 1	0.2	79.5	0.2	184	0.4	223	0.7	537
6	-0.2	78.8	+0.2	183	+0.4	221	-0.6	532
11	0.2	78.1	0.2	181	0.4	219	0.6	528
16	0.2	77.4	0.2	180	0.4	217	0.5	523
21	0.2	76.8	0.2	178	0.4	216	0.4	519
26	-0.2	76.2	+0.2	177	+0.4	214	-0.3	515
..
st. 23	+0.4	75.8	+0.9	176	+1.0	213	+3.9	512
28	0.4	76.4	0.9	177	1.0	215	3.9	516
iv. 2	0.4	77.0	1.0	178	1.0	216	4.0	520
7	0.5	77.7	1.0	180	1.0	218	4.1	525
12	+0.5	78.4	+1.0	182	+1.0	220	+4.1	530
17	0.5	79.1	1.0	183	1.0	222	4.2	534
22	0.5	79.8	1.0	185	1.0	224	4.2	539
27	0.5	80.5	1.0	187	1.0	226	4.3	544
sc. 2	0.5	81.3	1.0	188	1.0	228	4.3	549
7	+0.5	82.0	+1.0	190	+1.0	230	+4.3	554
12	0.5	82.7	1.0	192	1.0	232	4.3	559
17	0.5	83.4	1.0	193	1.0	234	4.3	564
22	0.5	84.1	1.0	195	1.0	236	4.3	568
27	0.5	84.8	1.0	197	1.0	238	4.2	573
32	+0.5	85.4	+1.0	198	+1.0	240	+4.2	577

APPARENT ORBITS OF THE SATELLITES OF URANUS AT DATE OF OPPOSITION, AUGUST 19, 1918, AS SEEN IN AN INVERTING TELESCOPE.



GREENWICH MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
May 11 19.2	May 15 14.0	May 3 17.6	May 5 19.3	Apr. 30 9.1	May 4 17.5	May 20 17.5 S.
19 8.7	23 3.4	12 0.5	14 2.2	May 9 2.0	13 10.4	27 11.1 N.
26 22.1	30 16.9	20 7.4	22 9.1	17 18.9	22 3.4	3 4.7 S.
June 3 11.6	June 7 6.3	28 14.3	30 16.0	26 11.8	30 20.3	9 22.2 N.
11 1.0	14 19.8	June 5 21.2	June 7 22.9	June 4 4.7	June 8 13.2	16 15.8 S.
18 14.5	22 9.2	14 4.1	16 5.8	12 21.7	17 6.1	23 9.3 N.
26 4.0	29 22.7	22 11.0	24 12.8	21 14.6	25 23.1	30 2.9 S.
July 3 17.4	July 7 12.1	30 17.9	July 2 19.7	30 7.5	July 4 16.0	July 6 20.5 N.
11 6.9	15 1.6	July 9 0.8	11 2.6	July 9 0.5	13 9.0	13 14.1 S.
18 20.3	22 15.1	17 7.8	19 9.5	17 17.4	22 1.9	20 7.6 N.
26 9.8	30 4.5	25 14.7	27 16.4	26 10.4	30 18.9	27 1.2 S.
Aug. 2 23.3	Aug. 6 18.0	Aug. 2 21.6	Aug. 4 23.3	Aug. 4 3.4	Aug. 8 11.8	Aug. 2 18.8 N.
10 12.7	14 7.5	11 4.5	13 6.3	12 20.4	17 4.8	9 12.4 S.
18 2.2	21 21.0	19 11.5	21 13.2	21 13.3	25 21.8	16 6.0 N.
25 15.7	29 10.4	27 18.4	29 20.2	30 6.3	Sept. 3 14.8	22 23.6 S.
Sept. 2 5.2	Sept. 5 23.9	Sept. 5 1.4	Sept. 7 3.1	Sept. 7 23.3	12 7.7	29 17.2 N.
9 18.6	13 13.4	13 8.3	15 10.0	16 16.2	21 0.7	5 10.8 S.
17 8.1	21 2.9	21 15.2	23 17.0	25 9.2	29 17.7	12 4.4 N.
24 21.6	28 16.4	29 22.2	Oct. 1 23.9	Oct. 4 2.2	Oct. 8 10.7	18 22.0 S.
Oct. 2 11.1	Oct. 6 5.8	Oct. 8 5.1	10 6.9	12 19.2	17 3.6	25 15.6 N.
10 0.6	13 19.3	16 12.1	18 13.8	21 12.1	25 20.6	2 9.2 S.
17 14.1	21 8.8	24 19.0	26 20.7	30 5.1	Nov. 3 13.6	9 2.8 N.
25 3.6	28 22.3	Nov. 2 2.0	Nov. 4 3.7	Nov. 7 22.1	12 6.5	15 20.4 S.
Nov. 1 17.0	Nov. 5 11.8	10 8.9	12 10.6	16 15.0	20 23.5	22 14.0 N.
9 6.5	13 1.3	18 15.8	20 17.6	25 8.0	29 16.4	29 7.5 S.

In the above diagram the central circle represents the planet.

For Ariel every third greatest elongation is given, and for Umbriel every alternate one; the intermediate ones may be found by adding multiples of the period of the satellite.

Sidereal period of Ariel, 2^d 12^h.489; of Umbriel, 4^d 3^h.460; of Titania, 8^d 16^h.941; of Oberon, 13^d 11^h.118.

Time from rthn ignation.	Ariel.		Umbriel.		Time from Northern Elongation.		Titania.		Time from Northern Elongation.		Oberon.	
	p^1	F	p^1	F			p^1	F			p^1	F
h	*		*		d	h	*		d	h	*	
0	349.0	1.000	349.0	1.000	0	0	349.0	1.000	0	0	349.0	1.000
2	353.2	0.981	351.6	0.993	0	5	352.1	0.990	0	8	352.2	0.990
4	357.8	0.926	354.2	0.972	0	10	355.2	0.961	0	16	355.5	0.958
6	3.2	0.838	357.0	0.938	0	15	358.7	0.913	1	0	359.0	0.907
8	10.1	0.722	0.0	0.892	0	20	2.6	0.848	1	8	3.2	0.838
10	19.9	0.591	3.4	0.833	1	1	7.2	0.769	1	16	8.1	0.754
12	35.3	0.461	7.4	0.765	1	6	13.0	0.679	2	0	14.4	0.659
14	60.6	0.369	12.2	0.690	1	11	20.7	0.582	2	8	22.9	0.559
16	93.6	0.362	18.3	0.609	1	16	31.4	0.487	2	16	35.1	0.462
18	120.2	0.447	26.2	0.528	1	21	46.8	0.406	3	0	52.9	0.386
20	136.6	0.575	36.9	0.452	2	2	68.2	0.358	3	8	76.0	0.353
22	146.9	0.707	51.5	0.390	2	7	92.3	0.360	3	16	100.9	0.375
0	154.1	0.825	70.2	0.355	2	12	113.1	0.413	4	0	119.9	0.445
2	159.6	0.917	90.5	0.358	2	17	128.0	0.497	4	8	133.1	0.539
4	164.2	0.976	108.7	0.397	2	22	138.3	0.592	4	16	142.1	0.640
6	168.5	1.000	122.7	0.461	3	3	145.7	0.689	5	0	148.8	0.736
8	172.7	0.985	133.0	0.539	3	8	151.3	0.778	5	8	154.0	0.823
10	177.2	0.934	140.6	0.620	3	13	155.9	0.856	5	16	158.2	0.895
12	182.5	0.850	146.5	0.700	3	18	159.7	0.919	6	0	161.9	0.950
14	189.1	0.738	151.2	0.775	3	23	163.1	0.965	6	8	165.2	0.985
16	198.4	0.608	155.1	0.842	4	4	166.3	0.992	6	16	168.4	1.000
18	213.0	0.476	158.4	0.898	4	9	169.3	1.000	7	0	171.5	0.993
20	236.9	0.376	161.4	0.943	4	14	172.4	0.988	7	8	174.8	0.966
22	269.6	0.357	164.2	0.976	4	19	175.6	0.956	7	16	178.3	0.918
0	297.6	0.433	166.8	0.995	5	0	179.1	0.907	8	0	182.3	0.853
2	315.0	0.558	169.3	1.000	5	5	183.0	0.840	8	8	187.0	0.771
4	325.9	0.691	171.9	0.991	5	10	187.8	0.760	8	16	193.0	0.678
6	333.3	0.812	174.6	0.968	5	15	193.7	0.668	9	0	201.0	0.578
8	339.0	0.907	177.4	0.933	5	20	201.6	0.572	9	8	212.3	0.480
10	343.7	0.971	180.4	0.884	6	1	212.8	0.477	9	16	228.9	0.398
12	348.0	0.999	183.9	0.825	6	6	228.8	0.399	10	0	251.6	0.355
14	352.2	0.989	188.0	0.756	6	11	250.7	0.355	10	8	276.4	0.366
16			193.0	0.679	6	16	274.8	0.364	10	16	296.7	0.429
18			199.2	0.598	6	21	294.9	0.421	11	0	310.9	0.520
20			207.4	0.517	7	2	309.2	0.507	11	8	320.6	0.620
22			218.6	0.442	7	7	319.2	0.603	11	16	327.6	0.718
0			233.8	0.384	7	12	326.4	0.698	12	0	333.0	0.807
2			252.9	0.354	7	17	331.9	0.787	12	8	337.4	0.882
4			273.2	0.362	7	22	336.3	0.863	12	16	341.2	0.940
6			290.8	0.404	8	3	340.1	0.925	13	0	344.6	0.980
8			304.3	0.471	8	8	343.5	0.969	13	8	347.8	0.998
10			314.2	0.550	8	13	346.6	0.994	13	16	350.9	0.996
12			321.5	0.631	8	18	349.6	1.000				
14			327.2	0.711								
16			331.7	0.784								
18			335.5	0.850								
20			338.8	0.905								
22			341.8	0.949								
0			344.5	0.979								
2			347.1	0.996								
4			349.7	1.000								

Position angle of satellite $p = p^1 + (P - P_0)$.Apparent distance of satellite $s = F^{(p)}$.

SATELLITES OF URANUS, 1918.

FOR GREENWICH MEAN NOON.

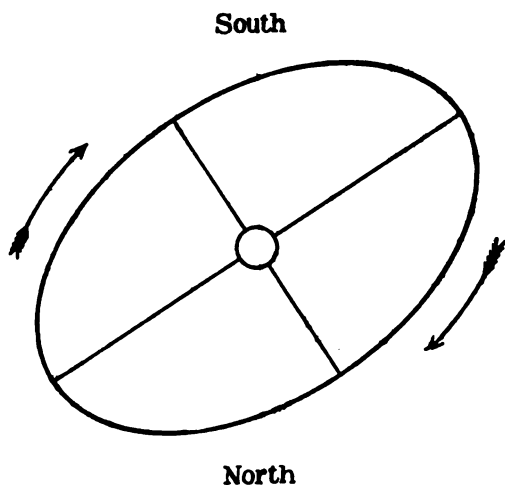
Date.	P-P ₀	$\frac{\alpha(p)}{p}$				Date.	P-P ₀	$\frac{\alpha(p)}{p}$			
		Ariel.	Umbriel.	Titania.	Oberon.			Ariel.	Umbriel.	Titania.	Oberon.
Apr. 20	-0.4	12.9	18.0	29.6	39.6	Aug. 18	0.0	13.9	19.4	31.8	42.6
25	0.4	13.0	18.1	29.7	39.7	23	0.0	13.9	19.4	31.8	42.6
30	0.5	13.0	18.2	29.8	39.8	28	+0.1	13.9	19.4	31.8	42.5
May 5	0.5	13.1	18.2	29.9	40.0	Sept. 2	0.2	13.9	19.4	31.8	42.5
10	0.5	13.1	18.3	30.0	40.2	7	0.2	13.9	19.3	31.7	42.4
15	-0.5	13.2	18.4	30.2	40.3	12	+0.3	13.9	19.3	31.7	42.4
20	0.5	13.2	18.5	30.3	40.5	17	0.3	13.8	19.3	31.6	42.3
25	0.6	13.3	18.5	30.4	40.7	22	0.4	13.8	19.2	31.5	42.2
30	0.6	13.4	18.6	30.5	40.8	27	0.4	13.8	19.2	31.4	42.0
June 4	0.6	13.4	18.7	30.7	41.0	Oct. 2	0.4	13.7	19.1	31.3	41.9
9	-0.6	13.5	18.8	30.8	41.2	7	+0.5	13.7	19.0	31.2	41.8
14	0.5	13.5	18.8	30.9	41.3	12	0.5	13.6	19.0	31.1	41.6
19	0.5	13.6	18.9	31.0	41.5	17	0.5	13.6	18.9	31.0	41.5
24	0.5	13.6	19.0	31.1	41.6	22	0.6	13.5	18.8	30.9	41.3
29	0.5	13.7	19.0	31.2	41.8	27	0.6	13.5	18.8	30.8	41.2
July 4	-0.5	13.7	19.1	31.3	41.9	Nov. 1	+0.6	13.4	18.7	30.7	41.0
9	0.4	13.8	19.2	31.4	42.0	6	0.6	13.4	18.6	30.5	40.8
14	0.4	13.8	19.2	31.5	42.2	11	0.6	13.3	18.5	30.4	40.6
19	0.3	13.8	19.3	31.6	42.3	16	0.5	13.2	18.4	30.2	40.5
24	0.3	13.8	19.3	31.6	42.3	21	0.5	13.2	18.4	30.1	40.3
29	-0.2	13.9	19.3	31.7	42.4	26	+0.5	13.1	18.3	30.0	40.1
Aug. 3	0.2	13.9	19.4	31.8	42.5	Dec. 1	0.5	13.1	18.2	29.9	40.0
8	0.1	13.9	19.4	31.8	42.5	6	0.4	13.0	18.1	29.8	39.8
13	-0.1	13.9	19.4	31.8	42.5	11	+0.4	13.0	18.1	29.6	39.6

SATELLITE OF NEPTUNE, 1918.

Time from Eastern Elongation.	p ¹	F	Time from Eastern Elongation.	p ¹	F	Date.	P-P ₀	$\frac{\alpha(p)}{p}$	Date.	P-P ₀	$\frac{\alpha(p)}{p}$
d h	°		d h	°		Jan. 1	+0.8	16.7	May 1	-1.5	16.2
0 0	122.5	1.000	3 0	300.1	0.999	6	0.6	16.8	6	1.4	16.2
0 3	117.7	0.994	3 3	295.3	0.988	11	0.5	16.8	11	1.4	16.1
0 6	112.8	0.979	3 6	290.3	0.967	16	0.3	16.8	16	1.3	16.1
0 9	107.6	0.953	3 9	285.0	0.936	21	0.2	16.8	21	-1.2	16.0
0 12	102.2	0.918	3 12	279.3	0.898	26	+0.0	16.8	Oct. 3	+3.3	16.0
0 15	96.2	0.876	3 15	273.0	0.853	31	-0.1	16.8	8	3.4	16.0
0 18	89.6	0.828	3 18	266.0	0.804	Feb. 5	0.3	16.8	13	3.5	16.1
0 21	82.2	0.779	3 21	258.1	0.754	10	0.5	16.8	18	3.6	16.1
1 0	73.7	0.730	4 0	249.1	0.707	15	0.6	16.8	23	3.7	16.2
1 3	64.1	0.686	4 3	239.0	0.668	20	-0.8	16.7	28	+3.7	16.2
1 6	53.4	0.652	4 6	227.7	0.640	25	0.9	16.7	Nov. 2	3.8	16.2
1 9	41.7	0.631	4 9	215.7	0.627	Mar. 2	1.0	16.7	7	3.8	16.3
1 12	29.5	0.627	4 12	203.5	0.631	7	1.1	16.7	12	3.8	16.3
1 15	17.5	0.639	4 15	191.8	0.651	12	1.2	16.6	17	3.8	16.4
1 18	6.2	0.667	4 18	181.0	0.686	17	-1.3	16.6	22	+3.8	16.4
1 21	356.0	0.707	4 21	171.4	0.729	22	1.4	16.6	27	3.7	16.5
2 0	347.0	0.753	5 0	163.0	0.778	27	1.5	16.5	Dec. 2	3.7	16.5
2 3	339.1	0.803	5 3	155.5	0.828	Apr. 1	1.5	16.5	7	3.6	16.6
2 6	332.0	0.852	5 6	148.9	0.875	6	1.6	16.4	12	3.5	16.6
2 9	325.8	0.897	5 9	142.9	0.917	11	-1.6	16.4	17	+3.4	16.6
2 12	320.1	0.936	5 12	137.4	0.952	16	1.6	16.3	22	3.4	16.7
2 15	314.8	0.966	5 15	132.3	0.978	21	1.6	16.3	27	3.2	16.7
2 18	309.8	0.988	5 18	127.4	0.994	26	-1.5	16.2	32	+3.1	16.7
2 21	304.9	0.999	5 21	122.6	1.000						

Position angle of satellite $p = p^1 + (P - P_0)$.Apparent distance of satellite $s = \frac{r^2 \alpha(p)}{p}$.

ARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION,
JANUARY 25, 1918, AS SEEN IN AN INVERTING TELESCOPE.



Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
Jan. 22	122.7	16.8
May 2	121.0	16.2
Oct. 13	126.0	16.1
Dec. 32	125.6	16.7

GREENWICH MEAN TIME OF GREATEST ELONGATION.

East.	West.	East.	West.	East.	West.
d h	d h	d h	d h	d h	d h
1 7.9	Jan. 4 6.4	Mar. 24 15.5	Mar. 27 14.0	Oct. 16 5.9	Oct. 19 4.5
7 5.0	10 3.5	30 12.6	Apr. 2 11.1	22 2.9	25 1.5
13 2.1	16 0.6	Apr. 5 9.7	8 8.2	28 0.0	30 22.5
18 23.2	21 21.8	11 6.8	14 5.3	Nov. 2 21.0	Nov. 5 19.5
24 20.4	27 18.9	17 3.8	20 2.3	8 18.0	11 16.5
30 17.5	Feb. 2 16.0	23 0.9	25 23.4	14 15.0	17 13.6
5 14.6	8 13.1	28 21.9	May 1 20.4	20 12.1	23 10.6
11 11.7	14 10.3	May 4 18.9	7 17.4	26 9.1	29 7.6
17 8.9	20 7.4	10 15.9	13 14.5	Dec. 2 6.2	Dec. 5 4.7
23 6.0	26 4.5	16 12.9	19 11.5	8 3.2	11 1.8
1 3.1	Mar. 4 1.6	22 9.9	25 8.5	14 0.3	16 22.8
7 0.2	9 22.7	Oct. 4 12.0	Oct. 7 10.5	19 21.4	22 19.9
12 21.3	15 19.8	10 9.0	13 7.5	25 18.5	28 17.0
18 18.4	21 16.9			31 15.6	34 14.1

In the above diagram the central circle represents the planet.

The sidereal period of the satellite of Neptune is 5^d 21^h.044.

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

			d	h	m				d	h	m
Jan.	1	4	-			⊕	in Perihelion.				
	2	21	-	♂	♀	☉	Inferior.				
	3	22	12	♂	♂	☾	..... ♂ + 8 46				
	4	19	-	♀			Greatest brilliancy.				
	9	0	-	♀			Greatest Hel. Lat. N.				
	11	4	8	♂	♂	☾	..... ♀ + 3 0				
	13	18	-				Stationary.				
	14	14	42	♂	♂	☾	..... ♂ - 5 7				
	14	22	42	♂	♀	☉	..... ♀ - 1 47				
	17	17	-	♀			Stationary.				
	21	13	49	♂	♂	☾	..... ♀ - 3 19				
	25	6	-	♂			Greatest elong. W. 24 42				
	25	23	-	♂	♂	☉	Stationary.				
	26	7	-	♂			Stationary.				
	26	15	18	♂	♂	☾	..... ♀ + 2 55				
	27	3	36	♂	♂	☾	..... ♀ + 4 28				
	29	15	-	♂			in Aphelion.				
	31	6	-	♂	♂	☉	..... ♂ + 9 19				
	31	16	3	♂	♂	☾	..... ♀ + 7 48				
	31	17	-	♂	♀	☉	..... ♀ + 7 48				
Feb.	1	11	-	♂			in ☿				
	3	8	-	♀			in Perihelion.				
	4	6	-				Stationary.				
	9	11	1	♂	♂	☾	..... ♀ - 3 39				
	9	14	-	♂	♀	☉	Inferior.				
	10	16	32	♂	♂	☾	..... ♀ + 4 38				
	11	3	32	♂	♂	☾	..... ♂ - 5 10				
	11	17	-				in Aphelion.				
	12	17	-	♂	♂	☉	..... ♂ + 3 39				
	17	20	44	♂	♂	☾	..... ♀ - 2 57				
	18	6	-	♂	♂	♀	..... ♀ - 10 40				
	21	14	-	♂	♂	☉	..... ♂ + 2 55				
	22	20	5	♂	♂	☾	..... ♀ + 4 22				
	23	5	36	♂	♂	☾	..... ♀ + 4 22				
	25	5	-	♀			Greatest Hel. Lat. N.				
	25	6	-	♂	♂	☾	..... ♀ - 1 31				
	27	15	28	♂	♂	☾	..... ♂ + 9 41				
	1	4	-	♀			Stationary.				
	4	1	-	♂			Greatest Hel. Lat. S.				
	9	19	5	♂	♀	☉	..... ♀ + 2 38				
Mar.	10	17	23	♂	♂	☾	..... ♂ - 5 19				
	12	12	27	♂	♂	☾	..... ♀ - 7 8				
	12	14	-	♂	♂	☉	Superior.				
	14	19	-	♂	♂	☉	..... ♂ + 3 4				
	16	5	-	♀			Greatest brilliancy.				
	17	9	9	♂	♂	☾	..... ♀ - 2 21				
	18	0	-	♂			nearest ⊕				
	20	22	26	♂			enters ♄, Spring com.				
	22	0	53	♂	♂	☾	..... ♀ + 3 4				
	22	8	32	♂	♂	☾	..... ♀ + 4 27				
	23	2	-	♂			in ☿				
Mar.	26	1	26	♂	♂	☾	..... ♂ + 9 15				
	27	16	-				in Perihelion.				
	2	4	-	♂	♀	☉	..... ♀ + 3 18				
	6	23	-	♂			Greatest Hel. Lat. N.				
	7	0	-	♂			Greatest elong. E. 19 18				
	7	5	46	♂	♂	☾	..... ♂ - 5 34				
	7	13	19	♂	♀	☉	..... ♀ - 3 14				
	9	1	-	♂			Stationary.				
	11	23	11	♂	♂	☾	..... ♀ - 0 32				
	14	2	19	♂	♂	☾	..... ♀ - 1 38				
Apr.	14	23	-	♂			Stationary.				
	16	9	-	♂			Stationary.				
	18	7	15	♂	♂	☾	..... ♀ + 3 19				
	18	14	43	♂	♂	☾	..... ♀ + 4 40				
	20	18	-	♀			Greatest elong. W. 46 15				
	21	19	14	♂	♂	☾	..... ♂ + 8 5				
	22	7	-	♀			in ☿				
	24	21	-	♂	♂	☉	Inferior.				
	26	15	-	♂	♂	☉	Stationary.				
	26	15	-	♂			Stationary.				
May	28	14	-	♂	♂	☉	in ☿				
	30	10	-	♂	♂	☉	in ☿				
	4	15	7	♂	♂	☾	..... ♂ - 5 50				
	6	23	7	♂	♂	☾	..... ♀ - 6 51				
	8	22	-	♂			Stationary.				
	8	22	27	♂	♂	☾	..... ♀ - 6 33				
	10	16	-				in Aphelion.				
	11	22	13	♂	♂	☾	..... ♀ - 0 37				
	15	15	50	♂	♂	☾	..... ♀ + 3 33				
	16	0	55	♂	♂	☾	..... ♀ + 4 57				
	18	23	-	♂	♂	☉	..... ♂ + 7 7				
	19	7	58	♂	♂	☾	..... ♂ + 7 7				
	24	2	-	♀			Greatest elong. W. 25 12				
	26	14	-	♂			in Aphelion.				
	31	0	-	♂			Greatest Hel. Lat. S.				
	31	21	32	♂	♂	☾	..... ♂ - 5 50				
	2	8	-	♂	♂	☾	Stationary.				
	5	11	18	♂	♂	☾	..... ♀ - 6 28				
	6	23	4	♂	♂	☾	..... ♀ - 4 34				
	8	-	-	♂			Tot. ecl. vis. at Wash.				
June	8	18	43	♂	♂	☾	..... ♀ - 0 18				
	12	1	59	♂	♂	☾	..... ♀ + 3 39				
	12	14	11	♂	♂	☾	..... ♀ + 5 11				
	15	4	-	♂	♂	☉	..... ♂ + 6 16				
	16	11	2	♂	♂	☾	..... ♂ + 6 16				
	18	3	-	♀			Greatest Hel. Lat. S.				
	19	1	-	♂			in ☿				
	20	8	-	♂	♂	☉	enters ♄, Summer com.				
	21	18	0	♂	♂	☉	enters ♄, Summer com.				
	22	9	-	♂	♂	☾	..... ♀ + 0 53				
	23	15	-	♂			in Perihelion.				

PLANETARY CONFIGURATIONS.

[illegible]

No.	Place.	Latitude.	Reduction to Geocen- tric Latitude.	Altitude (Meters).	Log ρ (including altitude).	Longitude from Greenwich.
		^h ^m ^s	[°] ['] ["]			^h ^m ^s
1	Abbadia, France . . .	+43 22 52.2	-11 34.4	69	9.999317	+ 0 7 0.1
2	Adelaide, S. Australia .	-34 55 38.0 ^a	+10 52.4	41 ^b	9.999526	- 9 14 20.07 ^a
3	Adelaide, S. Australia .	-34 55 37.4 ^c	+10 52.4	...	9.999523	- 9 14 20.17 ^c
4	Albany, N. Y. . . .	+42 39 12.7 ^a	-11 33.1	70 ^a	9.999336	+ 4 55 7.12 ^a
5	Albany, N. Y. . . .	+42 39 49.5 ^a	-11 33.1	52	9.999335	+ 4 54 59.97 ^a
6	Algiers, Algeria . . .	+36 47 50	-11 6.7	342	9.999501	- 0 12 8.38
7	Allegheny, Pa. . . .	+40 28 58.1 ^d	-11 26.7	370 ^d	9.999411	+ 5 20 5.39 ^d
8	Allegheny, Pa. . . .	+40 27 41.6	-11 26.6	...	9.999387	+ 5 20 2.93
9	Amherst, Mass. . . .	+42 21 56.5 ^e	-11 32.5	110 ^e	9.999346	+ 4 50 5.93 ^e
10	Amherst, Mass. . . .	+42 22 17.1 ^f	-11 32.5	...	9.999338	+ 4 50 4.67 ^f
11	Ann Arbor, Mich. . . .	+42 16 48.7 ^a	-11 32.3	282 ^a	9.999360	+ 5 34 55.27 ^a
12	Appleton, Wis. . . .	+44 15 39.2 ^g	-11 35.4	242	9.999307	+ 5 53 35.92 ^g
13	Arcetri, Italy	+43 45 14.4	-11 34.9	184	9.999316	- 0 45 1.30
14	Arequipa, Peru	-16 22 28.0 ^h	+ 6 15.2	2451 ^h	0.000052	+ 4 46 11.73 ^h
15	Armagh, Ireland . . .	+54 21 12.7 ^c	-10 59.6	61 ^c	9.999040	+ 0 26 35.4 ^c
16	Athens, Greece	+37 58 19.7 ⁱ	-11 14.3	107 ⁱ	9.999456	- 1 34 53 ⁱ
17	Baltimore, Md. . . .	+39 17 52.0 ^j	-11 21.5	36 ^j	9.999418	+ 5 6 29.1 ^j
18	Bamberg, Bavaria . . .	+49 53 6.0 ^c	-11 26.0	299 ^c	9.999167	- 0 43 33.57 ^c
19	Barcelona, Spain . . .	+41 25 18	-11 30.0	420	9.999391	- 0 8 28.0
20	Beloit, Wis.	+42 30 8.4	-11 32.8	...	9.999335	+ 5 56 7.4
21	Bergedorf, Germany . .	+53 28 46.2	-11 6.1	35	9.999060	- 0 40 57.74
22	Berkeley, Cal.	+37 52 23.6	-11 13.7	97	9.999458	+ 8 9 2.72
23	Berlin, Prussia	+52 30 16.7 ^k	-11 12.5	47 ^k	9.999085	- 0 53 34.80 ^l
24	Berlin, Prussia	+52 31 13.1	-11 12.4	...	9.999081	- 0 53 34.41
25	Berlin, Prussia	+52 31 30.7	-11 12.4	...	9.999081	- 0 53 27.40
26	Berlin, Prussia	+52 29 7	-11 12.6	38	9.999084	- 0 53 54.2
27	Berne, Switzerland . .	+46 57 8.7	-11 34.2	573	9.999260	- 0 29 45.70 ^c
28	Besançon, France . . .	+47 14 59.0	-11 33.7	312	9.999235	- 0 23 57.13
29	Birr Castle, Ireland . .	+53 5 47	-11 8.7	56	9.999071	+ 0 81 40.9
30	Bloomington, Ind. . . .	+39 9 56 ^d	-11 20.8	238 ^d	9.999435	+ 5 46 5
31	Bogota, Colombia . . .	+ 4 35 55.2 ^c	- 1 50.8	2634	0.000170	+ 4 56 23.5
32	Bombay (Colaba), India	+18 53 36.2 ^c	- 7 5.1	14 ^c	9.999849	- 4 51 15.72
33	Bonn, Prussia	+50 43 45.0 ^k	-11 22.3	62 ^l	9.999130	- 0 28 23.17
34	Bordeaux (Floirac), France	+44 50 7.2 ^a	-11 35.6	73	9.999281	+ 0 2 5.51
35	Boston, Mass.	+42 20 58 ^m	-11 32.5	31 ^m	9.999341	+ 4 44 19.1 ⁿ
36	Boston, Mass.	+42 21 32.5	-11 32.5	48	9.999342	+ 4 44 15.0
37	Bothkamp, Prussia . . .	+54 12 9.6 ⁿ	-11 0.8	32 ⁿ	9.999042	- 0 40 31.02
38	Bremen, Germany . . .	+53 4 36	-11 8.8	...	9.999067	- 0 35 15
39	Breslau, Prussia	+51 6 55.8 ^k	-11 20.4	147 ^k	9.999126	- 1 8 8.72
40	Brisbane, Queensland .	-27 28 0.0	+ 9 28.3	...	9.999691	-10 12 6.17
41	Brussels (Uccle), Belgium	+50 47 55.5 ^a	-11 21.9	105 ^a	9.999131	- 0 17 26.05
42	Brussels, Belgium . . .	+50 51 10.6 ^c	-11 21.7	...	9.999123	- 0 17 28.02
43	Budapest, Hungary . . .	+47 29 34.7 ^c	-11 33.2	131 ^c	9.999217	- 1 16 15.3
44	Cambridge, England . .	+52 12 51.6	-11 14.3	28	9.999091	- 0 0 22.75
45	Cambridge, Mass. . . .	+42 22 47.6 ^o	-11 32.6	24	9.999340	+ 4 44 31.05
46	Cape of Good Hope . . .	-33 56 3.5 ^p	+10 43.6	13 ^p	9.999548	- 1 13 54.76
47	Carloforte, Sardinia . .	+39 8 8.9 ^q	-11 20.7	18 ^q	9.999421	- 0 33 14.9
48	Catania, Sicily	+37 30 13.2 ^c	-11 11.4	49 ^c	9.999464	- 1 0 20.70
49	Charkow, Russia	+50 0 9.9 ^a	-11 25.5	138 ^r	9.999153	- 2 24 55.75
50	Charlottesville, Va. . . .	+38 2 1.2 ^e	-11 14.6	259 ^e	9.999465	+ 5 14 5.33

^a Meridian circle.^b Standard barometer.^c Transit instrument.^d Transit instrument pier.^e Center of large dome.^f Center of dome tower.^g Center of dome.^h Transit pier.ⁱ Circle Syngros.^j Center of instrument house.^k Center of observatory.^l Floor of meridian room.^m Foot of pillar of 7-in. equ.ⁿ Cube of equatorial.^o Dome of 15-in. equatorial^p 8-in. meridian circle.^q Zenith telescope.^r Barometer in meridian ro

Authority for—		Description.
Latitude.	Longitude.	
on., Bruxelles, 1907. Govt. Astronomer, 1913. Govt. Astronomer, 1913. a Director, 1913. a Director, 1913.	<i>Les Obs. Astron.</i> , Bruxelles, 1907. Letter from Govt. Astronomer, 1913. Letter from Govt. Astronomer, 1913. Letter from Director, 1913. Letter from Director, 1913.	Obs. Paris Acad. of Sci., Hendaye. Govt. Obs., since 1884. Govt. Obs., before 1884. Dudley Obs., since 1893. Dudley Obs., before 1893.
on., Bruxelles, 1907. is of Obs., 1909. a Director, 1897. a Director, 1913. a Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905. <i>Publications of Obs.</i> , 1909. Letter from Director, 1897. Letter from Director, 1913. Letter from Director, 1913.	At Bouzaréah. Old Obs. 3° 8 S., 8° E. a Obs. Western Univ. of Pa., since 1905. Obs. Western Univ. of Pa., before 1905. Amherst College Obs., since 1903. Lawrence Obs., before 1903.
is of Obs., 1915. te (b). 'Osserv., 1900. nnals, 1903. logue of Stars, 1840.	<i>Publications of Obs.</i> , 1915. See footnote (b). <i>Astron. Nach.</i> , Nr. 3993, 1905. <i>Harvard Annals</i> , 1903. <i>Armagh Catalogue of Stars</i> , 1840.	Detroit Obs., Univ. of Mich. Underwood Obs., Lawrence College. Royal Observatory. Branch of Harvard Coll. Obs. Armagh Observatory.
'Obs., 1910. a Director, 1913. a Director, 1913. on., Bruxelles, 1907. a Director, 1897.	Letter from Director, 1913. Letter from Director, 1913. <i>Astron. Nach.</i> , Nr. 3993, 1905. <i>Les Obs. Astron.</i> , Bruxelles, 1907. Letter from Director, 1897.	e National Observatory. Johns Hopkins Univ. Obs. Remeis Observatory.
a Director, 1913. a Director, 1897. ch., Nr. 3545, 1898. n Director, 1913. ch., Nr. 3170, 1893.	<i>Astron. Nach.</i> , Nr. 3993, 1905. Letter from Director, 1897. <i>Astron. Nach.</i> , Nr. 3993, 1905. Letter from Director, 1913. <i>Astron. Nach.</i> , Nr. 3170, 1893.	Hamburg Obs., since 1909. Students' Obs., Univ. of Cal. Royal Obs., since 1835. Royal Obs., before 1835. Urania Observatory.
ron., Bruxelles, 1907. hrbuch. ch., Nr. 2805, 1887. utical Almanac. a Director, 1913.	<i>Les Obs. Astron.</i> , Bruxelles, 1907. <i>Astron. Nach.</i> , Nr. 3202, 1893. <i>Astron. Nach.</i> , Nr. 2805, 1887. <i>British Nautical Almanac</i> . Letter from Director, 1913.	Treptow Observatory. Observatory, Cantonal Univ. National Observatory. Private Obs. of Earl of Rosse. Kirkwood Obs., Univ. of Ind.
n Director, 1913. n Director, 1913. n Director, 1913. n Director, 1897. n Director, 1909.	Letter from Director, 1913. Letter from Director, 1913. <i>Astron. Nach.</i> , Nr. 3993, 1905. <i>Annales de l'Obs.</i> , 1885. Letter from Director, 1909.	National Observatory. Government Observatory. Royal Observatory. Obs., Univ. of Bordeaux. Boston Univ. Obs., since 1908.
n Director, 1895. othkamp, 1872. ch., Nr. 15, 1822. n Director, 1897. utical Almanac.	Letter from Director, 1895. Letter from Director, 1913. <i>Astron. Nach.</i> , Nr. 15, 1822. <i>Astron. Nach.</i> , Nr. 3993, 1905. e <i>British Nautical Almanac</i> .	Boston Univ. Obs., before 1908. Obs. of Herr von Bülow. Formerly Olber's Obs. Royal University Obs. Brisbane Observatory.
n Director, 1913. : l'Obs., 1857. ch., Nr. 2752, 1886. n Director, 1879. nnals, 1887.	Letter from Director, 1913. Letter from Director, 1913. <i>Astron. Nach.</i> , Nr. 2752, 1886. Letter from Director, 1879. <i>U. S. C. and G. S. Report</i> , 1897.	Royal Obs., since 1891. Royal Obs., before 1891. University Observatory. University Observatory. Harvard College Obs.
atalogue of Stars, 1885. te (d). n Director, 1913. : l'Obs., 1904. n Director, 1913.	<i>Monthly Notices, R. A. S.</i> , Nov. 1908. Letter from Director, 1913. Letter from Director, 1913. <i>Annales de l'Obs.</i> , 1904. Letter from Director, 1913.	Royal Observatory. International Lat. Obs. Royal Obs. of Catania and Etna. University Observatory. Leander McCormick Obs., Univ. Va.

a Name of Western Univ. of Pa. changed in 1908; now the Univ. of Pittsburgh.

b Professional Papers, Corps of Engineers, U. S. A., 1882.

c Old meridian circle 0° 4 S., 0° 1 W. of Cercle Syngros.

d *Resultate des Internationalen Breitendienstes*, 1900-1908.

e With the new value of the longitude of Sydney.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ' "	° ' "			h m s	s
51	Chicago, Ill.	+41 50 1.0	-11 31.2		9.999352	+5 50 26.84	+57.57
52	Christiania, Norway . . .	+59 54 44.0 ^a	-10 4.6	25 ^a	9.998908	-0 42 53.50 ^a	- 7.05
53	Cincinnati, Ohio	+39 8 19.8 ^b	-11 20.7	247 ^b	9.999437	+5 37 41.40 ^b	+55.48
54	Cincinnati, Ohio	+39 6 26.5	-11 20.5		9.999421	+5 37 59.00	+55.52
55	Cleveland, Ohio	+41 30 14.5 ^c	-11 30.2	215 ^c	9.999375	+5 26 25.86 ^c	+53.62
56	Clinton, N. Y.	+43 3 17.0	-11 33.9	276	9.999340	+5 1 37.45	+49.55
57	Coimbra, Portugal	+40 12 24.5	-11 25.6	99	9.999400	+0 33 43.1	+ 5.54
58	Columbia, Mo.	+38 56 51.7 ^d	-11 19.7	225 ^e	9.999440	+6 9 18.33 ^d	+60.67
59	Columbus, Ohio	+39 59 50.4 ^d	-11 24.7	233 ^d	9.999414	+5 32 2.60 ^d	+54.55
60	Copenhagen, Denmark . .	+55 41 12.6	-10 48.6	14	9.999005	-0 50 18.69 ^f	- 8.26
61	Cordova, Arg. Rep.	-31 25 15.5 ^g	+10 18.0	434 ^g	9.999634	+4 16 48.22 ^g	+42.19
62	Cracow, Austria	+50 3 52.0 ^a	-11 25.2	221 ^a	9.999157	-1 19 50.27 ^a	-13.12
63	Danzig, Prussia	+54 21 18.0	-10 59.6	3	9.999036	-1 14 39.6	-12.28
64	Dehra Dun, India	+30 18 51.8 ^h	-10 5.3	681 ^h	9.999676	-5 12 11.76 ^h	-51.28
65	Denver, Colo.	+39 40 36.4 ^a	-11 23.3	1644 ⁱ	9.999518	+6 59 47.72 ^a	+68.96
66	Des Moines, Iowa	+41 36 0	-11 30.5	296	9.999378	+6 14 30.56	+61.52
67	Dorpat (Jurjew), Russia .	+58 22 47.2 ^a	-10 22.1	67 ^a	9.998945	-1 46 53.22 ^a	-17.56
68	Dresden, Saxony	+51 2 16.8	-11 20.8	121	9.999126	-0 54 54.74	- 9.02
69	Dublin, Ireland	+53 23 13.1 ^a	-11 6.7	86 ^a	9.999066	+0 25 21.1 ^a	+ 4.16
70	Dun Echt, Scotland	+57 9 36	-10 34.8	141	9.998979	+0 9 40.0	+ 1.59
71	Durham England	+54 46 6.2 ^f	-10 56.4	107 ^k	9.999033	+0 6 19.75 ^f	+ 1.04
72	Dusseldorf, Prussia	+51 12 25.0 ^l	-11 19.9	46 ^l	9.999117	-0 27 2.69 ^l	- 4.44
73	Edinburgh, Scotland . . .	+55 55 30.0 ^a	-10 46.5	134 ^m	9.999007	+0 12 44.22 ^a	+ 2.09
74	Edinburgh, Scotland . . .	+55 57 23.2 ⁿ	-10 46.2	106 ^o	9.998995	+0 12 43.05 ⁿ	+ 2.09
75	Elmira, N. Y.	+42 6 25	-11 31.9		9.999345	+5 7 13.90	+50.47
76	Evanston, Ill.	+42 3 33.4	-11 31.8	175	9.999358	+5 50 42.3	+57.61
77	Flagstaff, Ariz.	+35 12 30.5	-10 54.7	2210	9.999667	+7 26 44.58	+73.39
78	Gaithersburg, Md.	+39 8 13.2 ^r	-11 20.7	165	9.999431	+5 8 47.73	+50.73
79	Geneva, N. Y.	+42 52 46.2	-11 33.6	152	9.999336	+5 8 1.00	+50.60
80	Geneva, Switzerland . . .	+46 11 59.3 ^a	-11 35.2	407 ^a	9.999268	-0 24 36.61 ^a	- 4.04
81	Genoa, Italy	+44 25 9.3 ^a	-11 35.5	105	9.999293	-0 35 41.28 ^a	- 5.66
82	Georgetown, D. C.	+33 54 26.7 ^b	-11 19.5	47	9.999429	+5 8 18.26 ^b	+50.65
83	Glasgow, Mo.	+39 13 45.6	-11 21.1	227	9.999433	+6 11 18.08	+61.00
84	Glasgow, Scotland	+55 52 42.8 ^a	-10 46.9	55 ^p	9.999003	+0 17 10.55 ^a	+ 2.82
85	Gotha, Germany	+50 56 37.9 ^l	-11 21.2	322 ^a	9.999142	-0 42 50.51 ^l	- 7.04
86	Gotha, Germany	+50 56 4.4 ^f	-11 21.2	360 ^f	9.999145	-0 42 55.09 ^f	- 7.05
87	Göttingen, Prussia	+51 31 48.1 ^q	-11 18.2	161 ^q	9.999116	-0 39 46.22 ^q	- 6.53
88	Greencastle, Ind.	+39 38 46.6 ^a	-11 23.1	262 ^a	9.999425	+5 47 24.36 ^a	+57.07
89	Greenwich, England	+51 28 38.2 ^a	-11 18.5	49 ^a	9.999110	0 0 0.00 ^a	0.00
90	Hamburg, Germany	+53 33 6.0	-11 5.6	25	9.999057	-0 39 53.60 ^a	- 6.55
91	Hamburg, Germany	+53 32 51.3 ^d	-11 5.6	30 ^d	9.999058	-0 39 53.46 ^d	- 6.55
92	Hanover, N. H.	+43 42 15.3	-11 34.8	183	9.999317	+4 49 8.02	+47.50
93	Haverford, Pa.	+40 0 40.1 ^r	-11 24.8		9.999398	+5 1 12.70 ^r	+49.48
94	Heidelberg, Baden	+49 23 55.2 ^s	-11 27.8	567 ^s	9.999198	-0 34 53.13 ^s	- 5.73
95	Heidelberg, Baden	+49 23 55.7 ^t	-11 27.8	570 ^t	9.999198	-0 34 52.96 ^t	- 5.73
96	Heidelberg, Baden	+49 24 34.3 ^l	-11 27.8	126 ^l	9.999168	-0 34 46.80 ^l	- 5.71
97	Helsingfors, Finland . . .	+60 9 42.3 ^a	-10 1.5	33 ^a	9.998903	-1 39 49.10 ^a	-16.40
98	Herény, Hungary	+47 15 47.4	-11 33.7	229	9.999229	-1 6 24.7	-10.91
99	Hong Kong, China	+22 18 13.2 ^f	- 8 7.4	33 ^f	9.999793	-7 36 41.86 ^f	-75.01
100	Iowa City, Iowa	+41 40 0	-11 30.7	183	9.999369	+6 6 6	+60.14

^a Meridian circle.^b Center of dome.^c Zenith telescope pier.^d Transit pier.^e Observatory bench mark.^f Center of observatory.^g Old meridian circle.^h Floor-level of zenith sector pillar.ⁱ Main floor.^j Transit instrument.^k Barometer in transit room.^l Equatorial.^m Standard barometer.ⁿ Point midway between transit instrument and mural circle.^o Floor of main building.^p Floor of meridian circle room.^q Position of meridian circle before 1888.^r Zenith telescope.^s Repsold meridian circle.^t Bruce telescope.

No.	Authority for—		Description.
	Latitude.	Longitude.	
51	U. S. Lake Survey, 1864.	Smithsonian Report, 1886.	^a Dearborn Observatory.
52	<i>Astron. Nach.</i> , Nr. 3193, 1893.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
53	<i>Publications of the Obs.</i> , 1908.	<i>Astronomical Journal</i> , 1897.	Cincinnati Obs., since 1873.
54	Letter from Director, 1897.	<i>Astronomical Journal</i> , 1864.	Cincinnati Obs., before 1873.
55	Letter from Director, 1913.	Letter from Director, 1913.	Case Obs., Case School of Appl'd Sci.
56	<i>Astron. Nach.</i> , Nr. 2553, 1883.	<i>Astron. Nach.</i> , Nr. 2553, 1883.	Litchfield Obs., Hamilton College.
57	<i>Eph. Astron. de Coimbra</i> , 1889.	<i>Eph. Astron. de Coimbra</i> , 1889.	University Observatory.
58	<i>Trans. Acad. of Sci. of St. Louis</i> , 1894.	<i>Trans. Acad. of Sci. of St. Louis</i> , 1894.	Laws Obs., Univ. of Mo.
59	Letter from Director, 1913.	Letter from Director, 1899.	McMillin Obs., State Univ.
60	British Nautical Almanac.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
61	<i>Resultados del Obs.</i> , 1887.	<i>Resultados del Obs.</i> , 1887.	National Observatory.
62	Letter from Director, 1913.	Letter from Director, 1913.	Imperial and Royal Obs.
63	Letter from Director, 1897.	Letter from Director, 1897.	Obs. of the School of Navigation.
64	<i>Great Trig. Survey of India</i> , 1906.	Letter from Supt. of Survey, 1913.	Haig Obs., Trig. Survey of India.
65	Letter from Director, 1913.	Letter from Director, 1913.	Chamberlin Obs., Univ. of Denver.
66	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Drake Univ. Obs.
67	<i>Publikationen der Sternw.</i> , 1911.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial University Obs.
68	<i>Berliner Jahrbuch</i> .	<i>Berliner Jahrbuch</i> .	^b Baron Engelhardt's Obs.
69	<i>Trans. Royal Dublin Soc.</i> , 1889.	<i>Trans. Royal Irish Acad.</i> , 1838.	Dunsink Obs., Trinity College.
70	Letter from Royal Astronomer, 1897.	Letter from Royal Astronomer, 1897.	^c Lord Crawford's Obs.
71	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
72	<i>Astron. Nach.</i> , Nr. 643, 1848.	Letter from Director, 1913.	Municipal Obs., Bilk.
73	<i>Monthly Notices, R. A. S.</i> , 1907.	Letter from Director, 1913.	Royal Obs. since 1895; Blackford Hill.
74	<i>Monthly Notices, R. A. S.</i> , 1836.	<i>Edinburgh Observations</i> , 1858.	^d Royal Obs. before 1895; Calton Hill.
75	Letter from Director, 1912.	Letter from Director, 1912.	Elmira College Obs.
76	Letter from Director, 1893.	Letter from Director, 1893.	Dearborn Obs., North Western Univ.
77	British Nautical Almanac.	British Nautical Almanac.	Lowell Observatory.
78	See footnote (j).	See footnote (k).	International Lat. Obs.
79	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Smith Observatory.
80	<i>Memoire par J. Pidoix</i> , 1900.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Municipal Observatory.
81	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Hydrographic Institute.
82	See footnote (e).	See footnote (e).	Georgetown College Obs.
83	<i>Astron. Nach.</i> , Nr. 2625, 1884.	<i>Washington Observations</i> , 1877.	Morrison Observatory.
84	<i>First Glasgow Catalogue</i> , 1870.	<i>Monthly Notices, R. A. S.</i> , 1865.	University Observatory.
85	Letter from Director, 1913.	Letter from Director, 1913.	Ducal Obs. since 1857.
86	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Ducal Obs. before 1857
87	<i>Astron. Nach.</i> , Nr. 4428, 1910.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
88	Letter from Director, 1912.	Letter from Director, 1912.	McKim Obs., De Pauw Univ.
89	<i>Greenwich Observations</i> , 1910.	<i>Greenwich Observations</i> , 1910.	^f Royal Observatory.
90	Letter, Director new Obs., 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	^g Hamburg Observatory before 1909.
91	Letter from Director, 1913.	Letter from Director, 1913.	^h Imperial Marine Obs.
92	Letter from Director, 1894.	Letter from Director, 1894.	Shattuck Obs., Dartmouth College.
93	<i>Proc. Amer. Ph. Soc.</i> , 1883.	<i>Proc. Amer. Ph. Soc.</i> , 1883.	Haverford College Obs.
94	Letter from Director, 1913.	Letter from Director, 1913.	Astron. Institute, Königstuhl Obs.
95	<i>Publik. des Obs., Königstuhl</i> , 1902.	<i>Publik. des Obs., Königstuhl</i> , 1902.	Astrophys. Inst., Königstuhl Obs.
96	<i>Publik. des Obs., Königstuhl</i> , 1902.	<i>Publik. des Obs., Königstuhl</i> , 1902.	ⁱ Dr. Wolf's Obs. before 1898.
97	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Univ. Obs.
98	<i>Astron. Nach.</i> , Nr. 2633, 1884.	British Nautical Almanac.	Astrophysical Observatory.
99	<i>Hong Kong Observations</i> , 1897.	Letter from Director, 1897.	Colonial Observatory.
100	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Obs., Univ. of Iowa.

^a Transferred to Evanston, Ill., in 1887.^b Instruments transferred to Univ. of Kasan in 1897.^c Instruments transferred to Royal Obs. at Edinburgh in 1896.^d City Obs. since 1896.^e Based upon data from the U. S. C. and G. Survey.^f Point of reference before 1851, 7½ ft. N., 19 ft. W.^g At Bergedorf since 1909.^h Transit instrument before 1908, 0° 5' N., 0° 04' W.ⁱ Instruments transferred to the Astrophysical Institute of the Königstuhl Obs. in 1908.^j *Resultate des Internationalen Breitendienstes*, 1900-1908.^k *Resultate des Internationalen Breitendienstes*, Band I, 1903.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		' "	' "			h m s	s
101	Ithaca, N. Y.	+42 26 47.3 ^a	-11 32.6	256 ^a	9.999354	+5 5 55.99 ^a	+50.26
102	Ithaca, N. Y.	+42 26 51.4	-11 32.6		9.999337	+5 5 56.47	+50.26
103	Jamaica, West Indies . .	+18 24 51 ^b	- 6 55.9	540 ^b	9.999892	+5 11 29.48 ^b	+51.17
104	Jena, Saxe-Weimar . . .	+50 55 34.9 ^c	-11 21.3	165 ^c	9.999132	-0 46 20.22 ^c	- 7.61
105	Jena, Saxe-Weimar . . .	+50 55 35.8	-11 21.3	155	9.999131	-0 46 20.31	- 7.61
106	Jena, Saxe-Weimar . . .	+50 56 11.0	-11 21.3	174	9.999132	-0 46 20.73	- 7.61
107	Johannesburg, Transvaal	-26 10 54.6 ^d	+ 9 9.8	1804 ^d	9.999840	-1 52 18.0 ^d	-18.45
108	Kalocsa, Hungary	+46 31 41.7 ^b	-11 34.8	117 ^e	9.999240	-1 15 54.12 ^b	-12.47
109	Kasan, Russia	+55 50 20.0 ^f	-10 47.3	98 ^f	9.999007	-3 15 15.61 ^f	-32.08
110	Kasan, Russia	+55 47 23.9 ^g	-10 47.7	79 ^g	9.999007	-3 16 29.00 ^g	-32.28
111	Kew, England	+51 28 6	-11 18.5	10	9.999108	+0 1 15.1	+ 0.21
112	Kief, Russia	+50 27 10.0 ^w	-11 23.5	179 ^f	9.999145	-2 2 0.56 ^f	-20.04
113	Kiel, Prussia	+54 20 17.6 ^f	-10 59.7	52 ^f	9.999040	-0 40 35.45 ^f	- 6.67
114	Kis-Kartal, Hungary . . .	+47 41 54.8	-11 32.8		9.999202	-1 18 11.7	-12.85
115	Königsberg, Prussia . . .	+54 42 50.5 ^f	-10 56.8	24 ^f	9.999029	-1 21 58.97 ^f	-13.47
116	Kremsmunster, Austria . .	+48 3 23.1 ^f	-11 32.0	334 ^f	9.999220	-0 56 31.58 ^f	- 9.29
117	La Plata, Arg. Rep. . . .	-34 54 31.8 ^h	+10 52.2	18 ^h	9.999525	+3 51 44.8 ^h	+38.07
118	Leiden, Netherlands . . .	+52 9 19.8 ^f	-11 14.6	6 ^f	9.999090	-0 17 56.15 ^f	- 2.95
119	Leipzig, Saxony	+51 20 5.9 ⁱ	-11 19.2	119 ⁱ	9.999118	-0 49 33.92 ⁱ	- 8.14
120	Leipzig, Saxony	+51 20 20.1	-11 19.2		9.999110	-0 49 29.92	- 8.13
121	Liege, Belgium	+50 37 6	-11 22.8	127	9.999137	-0 22 15.44	- 3.66
122	Lisbon (Tapada), Portugal	+38 42 30.5 ^f	-11 18.5	95 ^f	9.999437	+0 36 44.68 ^f	+ 6.04
123	Liverpool, England	+53 24 4.8	-11 6.6	61	9.999064	+0 12 17.33	+ 2.02
124	Liverpool, England	+53 24 47.8	-11 6.5		9.999059	+0 12 0.11	+ 1.97
125	Lund, Sweden	+55 41 51.6 ⁱ	-10 48.5	38	9.999006	-0 52 44.97 ⁱ	- 8.67
126	Lund, Sweden	+55 52 12.0	-10 47.0		9.999000	-0 52 47.50	- 8.67
127	Lussinpiccolo, Austria . .	+44 32 11.0	-11 35.5	42	9.999286	-0 57 52.41	- 9.51
128	Lyons, France	+45 41 41.0	-11 35.5	299	9.999274	-0 19 8.52 ^k	- 3.14
129	Madison, Wis.	+43 4 36.8 ^f	-11 33.9	292 ^l	9.999340	+5 57 37.90 ^f	+58.75
130	Madras, India	+13 4 8.0 ^f	- 5 5.5	7	9.999926	-5 20 59.14	-52.73
131	Madrid, Spain	+40 24 30.0 ^m	-11 26.4	655 ^m	9.999433	+0 14 45.09 ^m	+ 2.42
132	Manila, P. I.	+14 34 41	- 5 38.2	3	9.999908	-8 3 54.2	-79.48
133	Mare Island, Cal.	+38 5 55.8 ⁿ	-11 15.0	18 ⁿ	9.999447	+8 9 5.63 ⁿ	+80.35
134	Markree, Ireland	+54 10 31.8	-11 1.0	45	9.999044	+0 33 48.4	+ 5.55
135	Marseilles, France	+43 18 19 ^f	-11 34.3	75 ^o	9.999320	-0 21 34.55 ^f	- 3.54
136	Marseilles, France	+43 17 52	-11 34.3	27	9.999317	-0 21 28.1	- 3.53
137	Mauritius (Port Louis) . .	-20 5 39	+ 7 27.7	54	9.999832	-3 50 12.6	-37.82
138	Melbourne, Victoria . . .	-37 49 53.2 ^p	+11 13.4	28 ^q	9.999454	-9 39 53.92 ^p	-95.26
139	Meudon, France	+48 48 18	-11 29.8	162	9.999185	-0 8 55.6	- 1.47
140	Middletown, Conn.	+41 33 16.0	-11 30.4		9.999359	+4 50 37.18	+47.74
141	Milan, Italy	+45 27 59.3	-11 35.6	120	9.999268	-0 36 45.88 ^g	- 6.04
142	Minneapolis, Minn.	+44 58 40.0 ^r	-11 35.7	260 ^r	9.999290	+6 12 56.84 ^r	+61.27
143	Mizusawa, Japan	+39 8 3.6 ^x	-11 20.7	62	9.999424	-9 24 30.75	-92.74
144	Modena, Italy	+44 38 51.4	-11 35.6	64	9.999285	-0 43 43.40	- 7.18
145	Montreal, Canada	+45 30 20 ^s	-11 35.6	57 ^s	9.999262	+4 54 18.63 ^s	+48.35
146	Moscow (Presnia), Russia	+55 45 19.5	-10 48.0	150 ^f	9.999012	-2 30 17.03 ^f	-24.69
147	Mount Hamilton, Cal. . . .	+37 20 25.6 ^r	-11 10.4	1284 ^r	9.999552	+8 6 34.89 ^r	+79.93
148	Mount Wilson, Cal.	+34 12 59.5 ^t	-10 46.2	1799 ^t	9.999663	+7 52 14.33 ^t	+77.58
149	Mount Wilson, Cal.	+34 12 55	-10 46.1	1727 ^u	9.999658	+7 52 14.3	+77.58
150	Munich, Bavaria	+48 8 45.5 ^v	-11 31.7	529 ^v	9.999227	-0 46 26.02 ^v	- 7.63

^a Top of east pier in transit room.^b Transit instrument pier.^c Bamberg equatorial.^d International latitude hut.^e Seven-inch equatorial.^f Meridian circle.^g Center of great dome.^h Gautier meridian circle.ⁱ Center of observatory.^j Center of dome.^k Pier of small meridian circle.^l Main floor.^m Center of rotunda.ⁿ East transit instrument.^o Barometer.^p Old meridian circle.^q Floor of meridian room.

Transit instrument.

^r East transit pier.^s Snow telescope pier.^t Floor.^u West dome.^v Photographic equatorial, 41 feet south of prime vertical transit.^w Zenith telescope.

Authority for—		Description.
Latitude.	Longitude.	
Letter from the Dean, 1913. Letter from the Dean, 1913. <i>Memoirs, R. A. S.</i> , 1879. Letter from Director, 1913. Letter, Director new Obs., 1913.	Letter from the Dean, 1913. Letter from the Dean, 1913. See footnote (c). Letter from Director, 1913. Letter, Director new Obs., 1913.	a Fuertes Obs., Cornell Univ. b Fuertes Obs., Cornell Univ. Mr. Hall's Obs., Montego Bay. Univ. Obs., since 1888. Univ. Obs., before 1888.
V. J. S. <i>Astron. Gesell.</i> , 1910. Transvaal Obs. <i>Circular</i> , 1910. Letter from Director, 1913. Letter from Director, 1913. Publications of the Obs., 1911.	V. J. S. <i>Astron. Gesell.</i> , 1910. Transvaal Obs. <i>Circular</i> , 1910. Letter from Director, 1913. Publications of the Obs., 1911. Letter from Director, 1913.	The late Dr. Winkler's Obs. Union Obs., formerly Transvaal Obs. Archiepiscopal Haynald Obs. Engelhardt Obs., Univ. of Kasan. University Observatory.
Letter from Director, 1897. <i>Annales de l'Obs.</i> , Vol. IV, 1893. <i>Les Obs. Astron.</i> , Bruxelles, 1907. <i>Les Obs. Astron.</i> , Bruxelles, 1907. Letter from Director, 1913.	Letter from Director, 1897. <i>Astron. Nach.</i> , Nr. 3993, 1905. <i>Astron. Nach.</i> , Nr. 3993, 1905. <i>Les Obs. Astron.</i> , Bruxelles, 1907. <i>Astron. Nach.</i> , Nr. 3993, 1905.	Meteorological Obs., London. Imperial Univ. Obs. d Royal University Obs. Near Aszód, Hungary. Royal University Obs.
Letter from Director, 1897. Letter from Director, 1913. Letter from Director, 1913. Letter from Director, 1913. Letter, Director new Obs., 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905. Letter from Director, 1913. <i>Astron. Nach.</i> , Nr. 3993, 1905. <i>Astron. Nach.</i> , Nr. 3993, 1905. Letter, Director new Obs., 1913.	Obs. of the Benedictines. National Univ. Obs. University Observatory. University Obs., since 1861. University Obs., before 1861.
<i>Les Obs. Astron.</i> , Bruxelles, 1907. Letter from Director, 1913. <i>Monthly Notices, R. A. S.</i> , 1894. <i>British Nautical Almanac</i> , 1872. Letter from Director, 1913.	<i>Les Obs. Astron.</i> , Bruxelles, 1907. <i>Astron. Nach.</i> , Nr. 3202, 1893. <i>Monthly Notices, R. A. S.</i> , 1894. <i>British Nautical Almanac</i> , 1872. <i>Astron. Nach.</i> , Nr. 3993, 1905.	University Obs., Cointe. Obs. of Lisbon. Bidston, Birkenhead, since 1867. Liverpool Obs., before 1867. Royal Univ. Obs., since 1867.
Letter, Director new Obs., 1913. Letter from Director, 1897. Letter from Director, 1897. Publications of the Obs., 1892. Great Trig. Survey of India, 1906.	Letter, Director new Obs., 1913. Letter from Director, 1897. <i>Astron. Nach.</i> , Nr. 3202, 1893. Letter from Director, 1912. Great Trig. Survey of India, 1901.	Royal Univ. Obs., before 1867. Manora Observatory. Obs. of the Univ., St. Gents Laval. Washburn Obs., Univ. of Wis. Obs. founded by East India Co.
<i>Annuario del Obs.</i> , 1912. <i>Les Obs. Astron.</i> , Bruxelles, 1907. Letter from Director, 1913. <i>Astron. Nach.</i> , Nr. 758, 1851. Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905. <i>Les Obs. Astron.</i> , Bruxelles, 1907. <i>Lick Obs. Bulletin</i> , 1908. <i>British Nautical Almanac</i> , 1901. <i>Astron. Nach.</i> , Nr. 3993, 1905.	<i>Astron. and Meteorolog. Obs.</i> Meteorological Observatory. Chronom. and Time Sta., Navy Yd. Col. Cooper's Observatory. See footnote (e).
Letter, Director new Obs., 1913. Mag. and Meteor. Results, 1908. <i>Astron. Results</i> , 1881–84. <i>Les Obs. Astron.</i> , Bruxelles, 1907. Letter from Director, 1894.	Letter, Director new Obs., 1913. Mag. and Meteor. Results, 1908. i <i>Astron. Results</i> , 1881–84. <i>Les Obs. Astron.</i> , Bruxelles, 1907. Letter from Director, 1894.	See footnote (f). Royal Alfred Obs. g Government Observatory. Seine-et-Oise, near Paris. Wesleyan University Obs.
<i>Pubbl. del R. Osserv.</i> , 1914. Letter from Director, 1913. See footnote (h). Letter from Director, 1913. Letter from Director, 1912.	<i>Astron. Nach.</i> , Nr. 3993, 1905. Letter from Director, 1913. <i>Les Obs. Astron.</i> , Bruxelles, 1907. Letter from Director, 1913. U. S. C. and G. S. Report, 1897.	Royal Observatory, Brera. Obs. Univ. of Minn. International Lat. Obs. Royal Univ. Geophysical Obs. McGill University Obs.
<i>Les Obs. Astron.</i> , Bruxelles, 1907. Publications of the Obs., 1900. <i>Astrophysical Journal</i> , 1906. Letter from C. G. Abbot, 1912. Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905. U. S. C. and G. S. Report, 1897. <i>Astrophysical Journal</i> , 1906. Letter from C. G. Abbot, 1912. <i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. of the Imperial Univ. Lick Obs., Univ. of Cal. Solar Obs., Carnegie Inst. Branch of Smithsonian. Astrophys. Obs. Royal Observatory.

a Since 1902.

b Before 1902.

c *British Report on Transit of Venus*, 1882.

d Old position of meridian circle, 0° 9' N., 0° 12' E.

e National Obs., Univ. of Aix-Marseille, since 1864–66.

f National Obs., at Accoules, before 1864–66.

g Transferred from Williamstown in 1861.

h *Resultate des Internationalen Breitenkreises*, 1900–1908.

i With the new values of the longitudes of Adelaide and Sydney.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		" "	" "			h m s	"
151	Naples, Italy	+40 51 46.3	-11 28.1	164	9.999388	-0 57 1.70 ^a	- 9.37
152	Nashville, Tenn. . . .	+36 8 54.4 ^b	-11 2.0	172 ^c	9.999505	+5 47 12.2	+57.04
153	Neuchâtel, Switzerland	+46 59 50.6	-11 34.1	488	9.999254	-0 27 49.90 ^d	- 4.57
154	New Brunswick, N. J. . . .	+40 30 1.4 ^b	-11 26.7	21 ^b	9.999387	+4 57 47.45 ^b	+48.92
155	New Haven, Conn. . . .	+41 19 22.3	-11 29.6	40	9.999368	+4 51 40.58	+47.92
156	New Haven, Conn. . . .	+41 18 36.5	-11 29.6	. . .	9.999365	+4 51 42.16	+47.92
157	New York, N. Y. . . .	+40 48 34.6	-11 27.9	25	9.999380	+4 55 50	+48.00
158	New York, N. Y. . . .	+40 45 23.1	-11 27.7	. . .	9.999379	+4 55 53.64	+48.61
159	Nice, France	+43 43 16.9 ^e	-11 34.9	378	9.999330	-0 29 12.15 ^e	- 4.80
160	Nikolaieff, Russia	+46 58 22.1	-11 34.2	55	9.999225	-2 7 53.78 ^a	-21.01
161	Northampton, Mass. . . .	+42 19 1.9 ^b	-11 32.4	70 ^b	9.999345	+4 50 33.10 ^b	+47.73
162	Northfield, Minn. . . .	+44 27 4.6 ^f	-11 35.5	290 ^f	9.999305	+6 12 35.92 ^f	+61.21
163	Oakland, Cal. . . .	+37 48 5 ^d	-11 13.2	11 ^d	9.999454	+8 9 6.55 ^d	+80.35
164	Odessa, Russia	+46 28 37.5	-11 34.9	. . .	9.999234	-2 3 2.18 ^b	-20.21
165	Odessa, Russia	+46 28 36.7 ^d	-11 34.9	55 ^d	9.999237	-2 3 2.04 ^d	-20.21
166	O-Gyalla, Hungary	+47 52 27.3	-11 32.4	113	9.999206	-1 12 45.49	-11.95
167	Omaha, Nebr. . . .	+41 16 5.6 ^b	-11 29.5	344 ^b	9.999390	+6 23 46.96 ^b	+63.06
168	Orono, Me. . . .	+44 54 0	-11 35.6	38	9.999277	+4 34 40.3	+45.12
169	Ottawa, Canada	+45 23 39.1 ^d	-11 35.6	85 ^g	9.999267	+5 2 51.98 ^d	+49.75
170	Oxford, Miss. . . .	+34 22 12.6	-10 47.5	. . .	9.999536	+5 58 7.18	+58.83
171	Oxford, England	+51 45 35.6 ^d	-11 16.9	65 ^h	9.999104	+0 5 2.6	+ 0.83
172	Oxford, England	+51 45 34.2	-11 16.9	64	9.999104	+0 5 0.40	+ 0.82
173	Padua, Italy	+45 24 1.0 ⁱ	-11 35.6	31 ^j	9.999263	-0 47 29.13 ⁱ	- 7.80
174	Palermo, Sicily	+38 6 44.0 ^k	-11 15.1	76 ^d	9.999451	-0 53 25.87	- 8.78
175	Paris, France	+48 50 11.2 ^l	-11 29.8	67 ^m	9.999178	-0 9 20.93 ⁿ	- 1.53
176	Perth, West Australia	-31 57 8.9 ^d	+10 23.8	60	9.999597	-7 43 21.51 ^d	-76.12
177	Philadelphia, Pa. . . .	+39 58 2.1 ^o	-11 24.6	74 ^o	9.999404	+5 1 6.81 ^o	+49.46
178	Pola, Austria	+44 51 48.6 ^d	-11 35.6	32 ^d	9.999277	-0 55 23.07 ^d	- 9.10
179	Potsdam, Prussia	+52 22 56.0 ^p	-11 13.3	97 ^p	9.999901	-0 52 15.86 ^p	- 8.59
180	Poughkeepsie, N. Y. . . .	+41 41 18	-11 30.8	61	9.999360	+4 55 33.6 ^b	+48.55
181	Prague, Bohemia	+50 5 16.0 ^o	-11 25.1	197 ^o	9.999155	-0 57 40.28 ^o	- 9.47
182	Princeton, N. J. . . .	+40 20 55.8	-11 26.1	75	9.999395	+4 58 39.44	+49.06
183	Princeton, N. J. . . .	+40 20 57.8 ^d	-11 26.1	65 ^d	9.999394	+4 58 37.61 ^d	+49.06
184	Providence, R. I. . . .	+41 50 21	-11 31.2	64	9.999356	+4 45 35.95	+46.92
185	Providence, R. I. . . .	+41 49 46.4	-11 31.2	. . .	9.999352	+4 45 37.64	+46.92
186	Pulkowa, Russia	+59 46 18.7 ^a	-10 6.2	75 ^q	9.998914	-2 1 18.57 ^a	-19.93
187	Quebec, Canada	+46 47 59.2	-11 34.4	90	9.999231	+4 44 52.71 ^b	+46.80
188	Quito, Ecuador	- 0 14 0	+ 0 5.6	2908	0.000198	+5 14 6.66	+51.60
189	Riga, Russia	+56 57 9.3	-10 36.9	. . .	9.998974	-1 36 28.10 ^r	-15.85
190	Rio de Janeiro, Brazil	-22 54 23.8 ^o	+ 8 17.7	62 ^o	9.999784	+2 52 41.4 ^o	+28.37
191	Rome, Italy	+41 53 63.6 ^d	-11 31.3	51 ^j	9.999354	-0 49 55.12 ^d	- 8.20
192	Rome, Italy	+41 53 33.6 ^d	-11 31.3	65 ^q	9.999355	-0 49 56.34 ^d	- 8.20
193	Rome, Italy	+41 54 12.4 ^d	-11 31.4	100 ^d	9.999357	-0 49 48.02 ^d	- 8.18
194	Rome, Italy	+41 54 16.7	-11 31.4	75 ^j	9.999355	-0 49 49.28 ^d	- 8.18
195	San Fernando, Spain	+36 27 42.0 ^s	-11 4.3	30 ^s	9.999488	+0 24 49.32 ^s	+ 4.08
196	San Fernando, Spain	+36 31 7	-11 4.7	. . .	9.999485	+0 25 10.82	+ 4.14
197	San Francisco, Cal. . . .	+37 47 27.9	-11 13.2	. . .	9.999454	+8 9 42.86 ^t	+80.45
198	San Luis, Arg. Rep. . . .	-33 17 45.7	+10 37.6	800	9.999616	+4 25 22	+43.60
199	Santiago, Chile	-33 26 42 ^d	+10 39.0	520 ^d	9.999594	+4 42 46.0 ^d	+46.45
200	Santiago, Chile	-33 26 25	+10 38.9	619	9.999600	+4 42 36.5	+46.42
201	Santiago, Chile	-33 33 46 ^b	+10 40.1	580 ^b	9.999595	+4 42 46 ^b	+46.45

^a Center of observatory.^b Transit instrument.^c Bench mark on obs. steps.^d Meridian circle.^e Small meridian circle.^f Meridian circle pier.^g Bench mark in east wall.^h Barometer basin.ⁱ Axis of tower.^j Barometer.^k Center of south dome.^l South facade of observatory.^m Level of obs. terrace.ⁿ Cassini's Meridian.^o Center of dome.^p Center of middle dome.^q Main floor.^r Tower of school.^s Center of building, ground floor.^t West transit pier.

a.	Authority for—		Description.
	Latitude.	Longitude.	
1	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Royal Obs., Capo di Monte.
2	Letter from the Dean, 1913.	Letter from Director, 1893.	Obs. of Vanderbilt Univ.
3	Swiss Triangulation, 1890.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Cantonal Observatory.
4	Letter from Director, 1913.	Letter from Director, 1913.	Schanck Obs., Rutgers College.
5	Letter from Director, 1893.	See footnote (a).	Yale Univ. Obs., since 1882.
6	Letter, Director new Obs., 1893.	Letter, Director new Obs., 1893.	Yale Univ. Obs., before 1882.
7	<i>Contributions from the Obs.</i> , 1906.	<i>Contributions from the Obs.</i> , 1906.	Columbia Univ. Obs., since 1897.
8	Letter from Director, 1879.	British <i>Nautical Almanac</i> .	Columbia Univ. Obs., before 1897.
9	<i>Annales de l'Obs.</i> , Tome II, 1887.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Mt. Gros, near Nice.
10	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Naval Observatory.
11	Letter from Director, 1913.	Harvard <i>Annals</i> , 1893.	Smith College Obs.
12	Letter from Director, 1912.	<i>Publications of Obs.</i> , 1901.	a Goodsell Obs., Carleton College.
13	Letter from Director, 1912.	Letter from Director, 1912.	Chabot Observatory.
14	Pulkowa <i>Mitteilungen</i> , No. 56, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Branch of Pulkowa Obs.
15	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
16	Letter from Director, 1897.	Letter from Director, 1897.	Royal Astrophysical Obs.
17	Letter from Director, 1912.	Letter from Director, 1912.	Creighton University Obs.
18	Letter from Director, 1912.	Letter from Director, 1912.	Obs. Univ. of Maine.
19	Letter from Chief Astronomer, 1913.	Letter from Chief Astronomer, 1913.	Dominion Astronomical Obs.
20	Smithsonian Report, 1880.	Smithsonian Report, 1880.	Obs. Univ. of Mississippi.
21	<i>Radcliffe Catalogue of Stars</i> , 1900.	<i>Radcliffe Observations</i> , 1842.	Radcliffe Observatory.
22	<i>Oxford Astron. Observations</i> , 1878.	<i>Oxford Astron. Observations</i> , 1878.	University Observatory.
23	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
24	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Royal Observatory.
25	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Observatory of Paris.
26	<i>Meridian Observations</i> , Vol. 2, 1908.	<i>Meridian Observations</i> , Vol. 2, 1908.	Government Observatory.
27	Letter from Director, 1913.	Letter from Director, 1913.	Flower Obs., Univ. of Pa.
28	Letter from Director, 1913.	Letter from Director, 1913.	See footnote (b).
29	<i>Veröff. K. Preuss. Geod. Inst.</i> , 1905.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Astrophysical Obs.
30	Smithsonian Report, 1880.	Smithsonian Report, 1880.	Vassar College Obs.
31	Prague <i>Observations</i> , 1907.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial and Royal Obs.
32	Letter from Director, 1913.	Letter from Director, 1913.	Halsted Obs., Princeton Univ.
33	Letter from Director, 1913.	<i>Washington Observations</i> , 1878.	Obs. of Instruction, Princeton Univ.
34	Letter from Director, 1893.	Letter from Director, 1893.	Ladd Obs., Brown Univ.
35	<i>Astron. Nach.</i> , Nr. 2254, 1879.	<i>Astron. Nach.</i> , Nr. 2254, 1879.	Mr. Seagrave's Observatory.
36	<i>Description de l'Obs.</i> , 1845.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. Central Nicolas.
37	Letter from Director, 1912.	Letter from Director, 1912.	Quebec Obs., Plains of Abraham.
38	Letter from Director, 1897.	Letter from Director, 1897.	National Observatory.
39	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Polytechnic School Obs.
40	See footnote (c).	See footnote (c).	National Observatory.
41	<i>Memorie del R. Osserv.</i> , 1904.	Letter from Director, 1913.	Royal Obs. at Roman College.
42	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Univ. Obs. at Capitol.
43	Letter from Director, 1913.	Letter from Director, 1913.	Vatican Obs., since 1906-7.
44	<i>Publ. della Specola Vaticana</i> , 1905.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	d Vatican Obs., before 1906-7.
45	<i>Annales del Obs.</i> , 1892.	Letter from Director, 1913.	Naval Obs., since 1797.
46	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	e Naval Obs., before 1797.
47	Letter from Director, 1897.	<i>U. S. C. and G. S. Report</i> , 1897.	Davidson Observatory.
48	Letter from Director, 1911.	Letter from Director, 1911.	Southern Obs. of Carnegie Inst.
49	Letter from Director, 1913.	Letter from Director, 1913.	f National Obs., since 1862.
50	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	g National Obs., before 1862.
51	Letter from Director, 1913.	Letter from Director, 1913.	National Obs., Espejo.

a Old observatory, 1877-1886, 41.5 feet W.

b Observatory of Imperial and Royal Hydrographic Office.

c Green and Davis, *Telegraphic Determinations of Longitudes on the East Coast of South America*, 1880.

d In the Gregorian tower.

e In Cadix.

f In Quinta Normal.

g On the hill Santa Lucia, in Santiago.

h Based upon data from the U. S. C. and G. Survey.

i With the new value of the longitude of Sydney.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		' ' "	' ' "			^h ^m ^s	^s
202	South Bethlehem, Pa. . .	+40 36 23.2 ^a	-11 27.2	110	9.999391	+ 5 1 31.96 ^a	+ 49.53
203	South Hadley, Mass. . .	+42 15 18.2 ^b	-11 32.2	76 ^b	9.999346	+ 4 50 20.40 ^b	+ 47.70
204	St. Louis, Mo. . .	+38 38 3.0	-11 18.1	. . .	9.999432	+ 6 0 49.26	+ 59.27
205	St. Petersburg, Russia . .	+59 56 32.0	-10 4.2	4	9.998906	- 2 1 11.4	- 19.91
206	Stockholm, Sweden . .	+59 20 32.7 ^c	-10 11.3	44 ^c	9.998922	- 1 12 13.97 ^c	- 11.87
207	Stonyhurst, England . .	+53 50 40	-11 3.4	117 ^c	9.999056	+ 0 9 52.68	+ 1.62
208	Strassburg, Alsace . .	+48 35 0.3 ^c	-11 30.5	144 ^c	9.999190	- 0 31 4.52 ^c	- 5.11
209	Swarthmore, Pa. . .	+39 54 23.3	-11 24.3	. . .	9.999401	+ 5 1 24.89	+ 49.53
210	Sydney, N. S. W. . .	-33 51 41.1	+10 42.9	44	9.999552	-10 4 49.31	- 99.36
211	Syracuse, N. Y. . .	+43 2 13.1	-11 33.9	160	9.999332	+ 5 4 33.36	+ 50.08
212	Syracuse, N. Y. . .	+43 0 48.8 ^h	-11 33.8	137 ^h	9.999332	+ 5 4 34.31 ^h	+ 50.08
213	Tacubaya, Mexico . .	+19 24 17.9 ^c	- 7 14.8	2285 ^c	9.999995	+ 6 36 46.67 ^c	+ 65.18
214	Tashkent, Turkestan . .	+41 19 31.3	-11 29.6	457	9.999396	+ 4 37 10.80	- 45.53
215	Taunton, Mass. . .	+41 54 0	-11 31.3	8	9.999351	+ 4 44 20	+ 46.71
216	Teramo, Italy . .	+42 39 27 ^d	-11 33.1	398	9.999358	- 0 54 56	- 9.02
217	Tokyo, Japan . .	+35 39 17.0 ^c	-10 58.3	25	9.999507	- 9 18 58.22 ^c	- 91.82
218	Toronto, Canada . .	+43 39 46.0 ^f	-11 34.8	110 ^g	9.999313	+ 5 17 34.70 ^g	+ 52.17
219	Toronto, Canada . .	+43 40 0.8 ^g	-11 34.8	116 ^g	9.999313	+ 5 17 35.60 ^g	+ 52.17
220	Toulouse, France . .	+43 36 44.0	-11 34.7	194	9.999320	- 0 5 51.23	- 0.96
221	Triest, Austria . .	+45 38 35.5 ^h	-11 35.5	68 ⁱ	9.999260	- 0 55 5.23 ^h	- 9.08
222	Triest, Austria . .	+45 38 45.4 ^j	-11 35.5	26 ⁱ	9.999257	- 0 55 3.0	- 9.04
223	Tschardjui, Turkestan . .	+39 8 11.0 ^d	-11 20.7	188 ^d	9.999433	- 4 14 17.2 ^d	- 41.77
224	Tschardjui, Turkestan . .	+39 8 10.7 ^d	-11 20.7	167	9.999431	- 4 13 57.3	- 41.72
225	Tulse Hill, England . .	+51 26 47	-11 18.6	48	9.999111	+ 0 0 27.7	+ 0.08
226	Turin, Italy . .	+45 2 16.3 ^k	-11 35.7	616 ^k	9.999313	- 0 31 5.96 ^k	- 5.11
227	Turin, Italy . .	+45 4 8.3 ^c	-11 35.7	276 ⁱ	9.999288	- 0 30 47.15 ^c	- 5.06
228	Tuscaloosa, Ala. . .	+33 12 36.8 ^c	-10 36.7	69	9.999568	+ 5 50 11.74 ^c	+ 57.53
229	Ukiah, Cal. . .	+39 8 12.1 ^d	-11 20.7	220 ^d	9.999435	+ 8 12 50.3 ^d	+ 80.96
230	Uppsala, Sweden . .	+59 51 29.4 ^b	-10 5.2	21 ^b	9.998909	- 1 10 30.12 ^b	- 11.58
231	Urbana, Ill. . .	+40 6 20.2 ⁱ	-11 25.2	236 ⁱ	9.999412	+ 5 52 53.90 ⁱ	+ 57.97
232	Utrecht, Netherlands . .	+52 5 9.7 ^m	-11 15.0	12 ^m	9.999093	- 0 20 31.0 ^m	- 3.37
233	Utrecht, Netherlands . .	+52 5 13	-11 15.0	23	9.999093	- 0 20 28.9	- 3.36
234	Venice, Italy . .	+45 26 10.5 ^c	-11 35.6	15 ^c	9.999261	- 0 49 22.12 ^c	- 8.11
235	Vienna, Austria . .	+48 13 55.1 ⁿ	-11 31.5	240 ⁱ	9.999205	- 1 5 21.35 ⁿ	- 10.74
236	Vienna, Austria . .	+48 12 35.5	-11 31.6	186 ⁱ	9.999202	- 1 5 31.61	- 10.76
237	Vienna, Austria . .	+48 12 53.8	-11 31.6	214	9.999204	- 1 5 25.17	- 10.75
238	Vienna, Austria . .	+48 12 46.7 ^c	-11 31.6	285	9.999209	- 1 5 10.96	- 10.71
239	Warsaw, Russia . .	+52 13 4.6 ^c	-11 14.3	121 ^c	9.999097	- 1 24 7.25 ^c	- 13.82
240	Washington, D. C. . .	+38 55 14.0 ^o	-11 19.6	82 ^p	9.999431	+ 5 8 15.78 ^o	+ 50.64
241	Washington, D. C. . .	+38 53 38.7 ^q	-11 19.4	31 ^r	9.999428	+ 5 8 12.15 ^q	+ 50.63
242	Washington, D. C. . .	+38 53 17.3 ^s	-11 19.4	10 ^s	9.999427	+ 5 8 6.24 ^s	+ 50.61
243	Washington, D. C. . .	+38 56 14.8 ^a	-11 19.7	. . .	9.999425	+ 5 8 0.0 ^a	+ 50.60
244	Wellesley, Mass. . .	+42 17 34.8	-11 32.3	61	9.999344	+ 4 45 12.7	+ 46.85
245	Wellington, N. Z. . .	-41 17 3.8 ^b	+11 29.5	127 ^b	9.999375	-11 39 4.27 ^b	-114.84
246	West Point, N. Y. . .	+41 23 22.1	-11 29.9	170	9.999375	+ 4 55 50.55	+ 48.60
247	Wilhelmshaven, Germany	+53 31 52.1 ^c	-11 5.7	9 ^c	9.999057	- 0 32 35.06 ^c	- 5.35
248	Williams Bay, Wis. . .	+42 34 12.6 ^t	-11 33.0	320 ^t	9.999355	+ 5 54 13.24 ^t	+ 58.19
249	Williamstown, Mass. . .	+42 42 30	-11 33.2	213	9.999344	+ 4 52 50	+ 48.10
250	Winchester, Mass. . .	+42 27 11	-11 32.7	30	9.999338	+ 4 44 32.4	+ 46.74
251	Windsor, N. S. W. . .	-33 36 30.8 ^b	+10 40.6	16 ^r	9.999556	-10 3 19.9	- 99.11
252	Z6-Se, China . .	+31 5 48.0 ^c	-10 14.4	100 ^c	9.999619	- 8 4 44.82 ^c	- 79.63
253	Zurich, Switzerland . .	+47 22 38.3 ^c	-11 33.5	469 ^c	9.999243	- 0 34 12.26 ^c	- 5.62

^a Center of dome.^b Transit instrument.^c Meridian circle.^d Zenith telescope.^e Great transit instrument.^f Main dome.^g Transit pier.^h Equatorial pier.ⁱ Barometer cistern.^j Stone pier in terrace wall.^k Prime vertical instrument.^l 12-inch equatorial.^m Altazimuth pier.ⁿ Central dome.^o Center of the clock room.^p Ground floor of main building.^q Small dome.^r Barometer.^s Riderostat pier.^t 40-inch equatorial.^u Intersection of equatorial axes.

Authority for—

No.	Latitude.	Longitude.	Description.
202	Letter from Director, 1913.	<i>Washington Observations</i> , 1875.	Sayre Obs., Lehigh Univ.
203	<i>Amer. Jour. of Sci.</i> , 1883.	Letter from Director, 1913.	Williston Obs., Mt. Holyoke Coll.
204	Letter from Director, 1897.	<i>U. S. C. and G. S. Report</i> , 1897.	a Washington University Obs.
205	<i>Astron. Nach.</i> , Nr. 2582, 1884.	<i>Astron. Nach.</i> , Nr. 2582, 1884.	Imperial University Obs.
206	Letter from Director, 1914.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. of Acad. of Sci.
207	Letter from Director, 1913.	<i>Monthly Notices, R. A. S.</i> , 1881.	Stonyhurst College Obs.
208	<i>Annalen der Sternw.</i> , 1896.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Univ. Obs.
209	Letter from Director, 1912.	Letter from Director, 1912.	Sproul Obs., Swarthmore College.
210	<i>Astron. Results</i> , 1879-81.	See footnote (b).	Government Observatory.
211	Letter from Director, 1891.	Letter from Director, 1891.	Syracuse Univ. Obs.
212	Letter from Director, 1914.	Letter from Director, 1914.	Roe Observatory.
213	<i>Boletin del Obs.</i> , 1914.	<i>Anuario del Obs.</i> , 1902.	National Observatory.
214	Letter from Director, 1897.	Letter from Director, 1897.	Tashkent Observatory.
215	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Mr. Metcalf's Obs., before 1911.
216	<i>Pubbl. dell'Osserv.</i> , 1900.	Letter from Director, 1913.	Collurania Observatory.
217	<i>Annales de l'Obs.</i> , 1894.	<i>Annales de l'Obs.</i> , 1894.	University Observatory.
218	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
219	Letter from Director, 1912.	Letter from Director, 1912.	Meteorological Observatory.
220	<i>Annales de l'Obs.</i> , 1912.	<i>British Nautical Almanac</i> .	University Observatory.
221	Letter from Director, 1913.	Letter from Director, 1913.	c Imperial and Royal Maritime Obs.
222	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	d Imperial and Royal Maritime Obs.
223	<i>Astron. Nach.</i> , Nr. 4588, 1912.	Letter from Director, 1913.	International Lat. Obs., since 1909.
224	See footnote (e).	See footnote (f).	International Lat. Obs., before 1909.
225	<i>British Nautical Almanac</i> .	<i>British Nautical Almanac</i> .	Obs. of Sir W. Huggins, London.
226	Letter from Director, 1915.	Letter from Director, 1915.	f Royal Obs. of the Univ., since 1913.
227	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	g Royal Obs. of the Univ., before 1913.
228	Letter from Director, 1897.	Letter from Director, 1897.	Obs. Univ. of Ala.
229	See footnote (e).	Letter from Director, 1912.	International Lat. Obs.
230	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
231	Letter from Director, 1913.	Letter from Director, 1913.	Obs., Univ. of Ill.
232	Letter from Director, 1913.	Letter from Director, 1913.	University Obs., since 1855.
233	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1855.
234	Letter from Director, 1913.	Letter from Director, 1913.	Obs. of the Nautical Institute.
235	See footnote (h).	<i>Astron. Nach.</i> , Nr. 3993, 1905.	i Imperial and Royal Univ. Obs.
236	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	j Imperial and Royal Univ. Obs.
237	<i>Berliner Jahrbuch.</i>	<i>Berliner Jahrbuch.</i>	Oppolzer Obs., Josephstadt.
238	<i>Publik. der Sternw.</i> , 1892.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Kufner Obs., Ottakring.
239	<i>Astron. Nach.</i> , Nr. 4666, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial University Obs.
240	<i>U. S. Naval Obs. Publications</i> , 1900.	<i>U. S. C. and G. S. Report</i> , 1897.	U. S. N. Obs., Georgetown Heights.
241	See footnote (m).	<i>U. S. C. and G. S. Report</i> , 1897.	U. S. Naval Obs., 1842-1893.
242	Letter from Director, 1912.	Letter from Director, 1912.	Smithsonian Astrophysical Obs.
243	<i>Astronomical Journal</i> , 1897.	<i>Astronomical Journal</i> , 1897.	Catholic Univ. Obs., Brookland.
244	Letter from Director, 1912.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Whitn Obs., Wellesley College.
245	<i>New Zealand Gazette</i> , May 7, 1914.	<i>New Zealand Gazette</i> , May 7, 1914.	Hector Observatory.
246	Letter from Director, 1891.	Letter from Director, 1891.	k U. S. Military Academy.
247	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Naval Obs.
248	<i>Astrophysical Journal</i> , 1901.	<i>Astrophysical Journal</i> , 1901.	Yerkes Obs., Univ. of Chicago.
249	Letter from Director, 1893.	Letter from Director, 1893.	Field Memorial Obs., Williams Coll.
250	Letter from Director, 1913.	Letter from Director, 1913.	Mr. Metcalf's Obs., since 1911.
251	<i>Monthly Notices, R. A. S.</i> , 1884.	l <i>Monthly Notices, R. A. S.</i> , 1888.	Mr. John Tebbutt's Obs.
252	<i>Annales de l'Obs.</i> , 1907.	<i>Annales de l'Obs.</i> , 1907.	Obs. of the Jesuits near Shanghai.
253	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Obs. of Swiss Polytechnic School.

a Old observatory O. 125 E.

b Letter from Government Astronomer at Adelaide, 1913.

c Since 1898.

d Before 1898.

e *Resultate des Internationalen Breitendienstes*, 1900-1908.

f At Pino Torinese.

g At Palazzo Madama.

h *Astron. Arbeiten des K. K. Gradmessungs-Bureau*, 1896.

i Since 1879.

j Before 1879.

k Old observatory 9° N., 1-2 E.

l *Resultate des Internationalen Breitendienstes*, Band I, 1903.

m Washington Observations for 1892, Appendix I, pp. XXXI and XXXII.

n And the new value of the longitude of Sydney.

THE COMPUTATION OF LUNAR DISTANCES.

Tables of lunar distances are no longer given in the Ephemeris, in accordance with the decision of the Navy Department that they are now of little practical use to navigators. However, in case it is desired to use this method, the angular distance between the Moon and any heavenly body may be calculated by solving the spherical triangle of which the known parts are the polar distances of the Moon and the other body and the difference of their right ascensions, or, in other words, the angle at the pole between their hour-circles. Then, the Greenwich mean time of the observation being approximately known, and the lunar distances for the star or other body calculated for the even hour before and after, the required lunar distance may be interpolated and the longitude derived by the methods given in books on navigation.

EXAMPLE 1.

Find the lunar distance of Aldebaran, Feb. 23, 1918, at 10 P. M., Greenwich Mean Time.

Let α and δ — Right Ascension and Declination of the star	
" α' and δ' — " " " " " Moon	
" D — Lunar Distance	
Also let $\tan M = \tan \delta' \sec (\alpha - \alpha')$	
Then $\cos D = \sin \delta' \cos (M - \delta) \operatorname{cosec} M$	
$\alpha = 4^h 31^m 14^s.7$	$M = 31^\circ 15' 12''$
$\alpha' = 8^h 56^m 39^s.0$	$\delta = +16^\circ 20' 46''$
$\alpha - \alpha' = 19^h 34^m 35^s.7$	$M - \delta = 14^\circ 54' 26''$
$\alpha - \alpha' = 293^\circ 38' 56''$	$\sin \delta' = 9.373899$
$\delta' = +13^\circ 40' 56''$	$\cos (M - \delta) = 9.985131$
$\tan \delta' = 9.386401$	$\operatorname{cosec} M = 0.284981$
$\sec (\alpha - \alpha') = 0.396714$	$\cos D = 9.644011$
$\tan M = 9.783115$	$D = 63^\circ 51' 36''$

EXAMPLE 2.

Find the lunar distance of Jupiter Sept. 1, 1918, at noon, Greenwich Mean Time. In this case the distance is smaller and the following method is more accurate:

Let α and δ — Right Ascension and Declination of the planet	
" α' and δ' — " " " " " Moon	
" D — Lunar Distance	
Also let $\tan N = \tan \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} \frac{1}{2} (\delta - \delta')$	
Then $\sin \frac{1}{2} D = \sin \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} N$	
Sin N and $\sin \frac{1}{2} (\alpha - \alpha')$ have the same algebraic sign.	
$\alpha = 6^h 43^m 30^s.6$	$\tan \frac{1}{2} (\alpha - \alpha') = 9.078576 n$
$\alpha' = 7^h 38^m 10^s.6$	$\cos \frac{1}{2} (\delta + \delta') = 9.970813$
$\alpha - \alpha' = 23^h 5^m 20^s.0$	$\operatorname{cosec} \frac{1}{2} (\delta - \delta') = 1.434281$
$\alpha - \alpha' = 346^\circ 20' 0''$	$\tan N = 0.483670 n$
$\delta = +22^\circ 52' 48''$	$N = 108^\circ 10' 38''$
$\delta' = +18^\circ 39' 48''$	
$\delta + \delta' = +41^\circ 32' 36''$	$\sin \frac{1}{2} (\alpha - \alpha') = 9.075480$
$\delta - \delta' = +4^\circ 13' 0''$	$\cos \frac{1}{2} (\delta + \delta') = 9.970813$
	$\operatorname{cosec} N = 0.022233$
$\frac{1}{2} (\alpha - \alpha') = 173^\circ 10' 0''$	$\sin \frac{1}{2} D = 9.068526$
$\frac{1}{2} (\delta + \delta') = +20^\circ 46' 18''$	$\frac{1}{2} D = 6^\circ 43' 27''$
$\frac{1}{2} (\delta - \delta') = +2^\circ 6' 30''$	$D = 13^\circ 26' 54''$

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1918.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

Take out the apparent right ascension and declination of Polaris for the time of observation.

Subtract the apparent right ascension from the local sidereal time of observation and the remainder is the hour-angle of Polaris.

With this hour-angle as the vertical argument, and the apparent declination of Polaris as the horizontal argument, take out the correction from Table I and add it to or subtract it from the true altitude, according to its sign.

For other altitudes than 45° , corrections taken from the supplementary table at the bottom of Table I (Table Ia) may be applied when necessary for the degree of accuracy required.

Example.—1918, August 5, at $10^h 40^m 30^s$ P. M. local mean solar time, in longitude 59° west of Greenwich, suppose the true altitude of Polaris to be $33^\circ 20' 0''$, required the latitude of the place.

Local astronomical mean time	h	m	s
Reduction from Table III for $10^h 40^m 30^s$	10	40	30
Greenwich sidereal time of mean noon, August 5, page 10	8	52	54
Reduction from Table III, for longitude ($-3^h 56^m$ west, or plus)	+ 0	39	
Sum (having regard to signs) is equal to local sidereal time	19	35	48
R. A. of Polaris (page 281) for time of observation	1	31	36
Remainder is equal to hour-angle of Polaris	18	4	12
Decl. of Polaris (page 281) for time of observation, $88^\circ 52' 1''$			
True altitude	+33	20	0
Correction from Table I		-0	34
Correction from Table Ia			-13
Latitude of the place	+33	19	13

Observations of Polaris for latitude should be made when practicable near the times of upper or of lower culminations (hour-angle 0^h or 12^h). However, at sea, if made near elongation (hour-angle 6^h or 18^h), the hour-angle, and hence the local time, should be known within one minute.

Decl. H. A.	$88^\circ 52' 0''$	$88^\circ 52' 10''$	$88^\circ 52' 20''$	$88^\circ 52' 30''$	$88^\circ 52' 40''$	$88^\circ 52' 50''$	Decl. H. A.
h m	' "	' "	' "	' "	' "	' "	h m
0 0	-68 0 0	-67 50 0	-67 40 0	-67 30 0	-67 20 0	-67 10 0	24 0
3	68 0 1	67 50 1	67 40 1	67 30 1	67 20 1	67 10 1	23 57
6	67 59 2	67 49 2	67 39 2	67 29 2	67 19 2	67 9 2	54
9	67 57 3	67 47 3	67 37 3	67 27 3	67 17 3	67 7 3	51
12	67 54 3	67 44 3	67 34 3	67 24 3	67 14 3	67 4 3	48
0 15	-67 51 4	-67 41 4	-67 31 4	-67 21 4	-67 11 4	-67 1 4	23 45
18	67 47 4	67 37 4	67 27 4	67 17 4	67 7 4	66 57 4	42
21	67 43 4	67 33 4	67 23 4	67 13 4	67 3 4	66 53 4	39
24	67 37 6	67 27 6	67 17 6	67 7 6	66 57 6	66 48 6	36
27	67 31 6	67 21 6	67 11 6	67 1 6	66 51 6	66 42 6	33
0 30	-67 24 7	-67 14 7	-67 4 7	-66 55 8	-66 45 8	-66 35 8	23 30
33	67 17 8	67 7 8	66 57 8	66 47 8	66 37 8	66 27 8	27
36	67 9 8	66 59 8	66 49 8	66 39 8	66 29 8	66 19 8	24
39	67 0 9	66 50 9	66 40 9	66 30 9	66 21 9	66 11 9	21
42	66 50 10	66 41 10	66 31 10	66 21 10	66 11 10	66 1 10	18
0 45	-66 40 11	-66 30 11	-66 20 11	-66 11 11	-66 1 11	-65 51 11	23 15
48	66 29 12	66 19 12	66 9 12	66 0 12	65 50 12	65 40 12	12
51	66 17 12	66 8 12	65 58 12	65 48 12	65 38 12	65 29 12	9
54	66 5 13	65 55 13	65 46 13	65 36 13	65 26 13	65 17 13	6
0 57	65 52 14	65 42 14	65 33 14	65 23 14	65 13 14	65 4 14	3
1 0	-65 38 14	-65 29 15	-65 19 15	-65 9 15	-65 0 15	-64 50 15	23 0
3	65 24 15	65 14 15	65 5 15	64 55 15	64 45 15	64 36 15	22 57
6	65 9 16	64 59 16	64 50 16	64 40 16	64 30 16	64 21 16	54
9	64 53 16	64 43 16	64 34 16	64 24 16	64 15 16	64 5 16	51
1 12	-64 36 17	-64 27 16	-64 18 16	-64 8 16	-63 59 16	-63 49 16	22 48

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1918.

Decl. H. A.	88° 52' 0''	88° 52' 10''	88° 52' 20''	88° 52' 30''	88° 52' 40''	88° 52' 50''	Decl. H. A.
h m	' "	' "	' "	' "	' "	' "	h m
1 12	-64 36 17	-64 27 17	-64 18 18	-64 8 17	-63 59 17	-63 49 17	22 48
15	64 19 17	64 10 17	64 0 17	63 51 18	63 42 18	63 32 18	45
18	64 2 17	63 52 18	63 43 18	63 33 18	63 24 18	63 14 18	42
21	63 43 19	63 34 19	63 24 19	63 15 19	63 6 19	62 56 19	39
24	63 24 20	63 15 20	63 5 19	62 56 20	62 47 20	62 37 19	36
1 27	-63 4 20	-62 55 21	-62 46 21	-62 36 20	-62 27 20	-62 18 20	22 33
30	62 44 21	62 34 21	62 25 21	62 16 21	62 7 21	61 58 21	30
33	62 23 22	62 13 21	62 4 22	61 55 21	61 46 22	61 37 22	27
36	62 1 23	61 52 21	61 42 22	61 33 22	61 24 22	61 15 22	24
39	61 38 23	61 29 23	61 20 23	61 11 23	61 2 23	60 53 23	21
1 42	-61 15 24	-61 6 24	-60 57 23	-60 48 23	-60 39 23	-60 30 23	22 18
45	60 51 24	60 42 24	60 34 25	60 25 24	60 16 24	60 7 24	15
48	60 27 24	60 18 25	60 9 25	60 1 25	59 52 25	59 43 25	12
51	60 2 25	59 53 25	59 44 25	59 36 26	59 27 26	59 18 26	9
54	59 37 27	59 28 26	59 19 26	59 10 26	59 2 26	58 53 26	6
1 57	-59 10 27	-59 2 27	-58 53 27	-58 44 26	-58 36 26	-58 27 27	22 3
2 0	58 43 27	58 35 28	58 26 27	58 18 28	58 9 27	58 0 27	22 0
3	58 16 28	58 7 28	57 59 28	57 50 28	57 42 28	57 33 27	21 57
6	57 48 29	57 39 28	57 31 29	57 22 28	57 14 28	57 6 29	54
9	57 19 29	57 11 29	57 2 29	56 54 29	56 46 29	56 37 29	51
2 12	-56 50 30	-56 42 30	-56 33 29	-56 25 30	-56 17 30	-56 8 29	21 48
15	56 20 30	56 12 31	56 4 31	55 55 30	55 47 30	55 39 30	45
18	55 50 31	55 41 31	55 33 31	55 25 31	55 17 31	55 9 31	42
21	55 19 32	55 10 31	55 2 31	54 54 31	54 46 31	54 38 31	39
24	54 47 32	54 39 32	54 31 32	54 23 32	54 15 32	54 7 32	36
2 27	-54 15 33	-54 7 33	-53 59 33	-53 51 33	-53 43 32	-53 35 32	21 33
30	53 42 33	53 34 33	53 26 33	53 18 33	53 11 33	53 3 33	30
33	53 9 34	53 1 34	52 53 34	52 45 33	52 38 34	52 30 34	27
36	52 35 34	52 27 34	52 19 34	52 12 34	52 4 34	51 56 34	24
39	52 1 35	51 53 35	51 45 34	51 38 35	51 30 35	51 22 34	21
2 42	-51 26 36	-51 18 35	-51 11 36	-51 3 36	-50 55 36	-50 48 35	21 18
45	50 50 36	50 43 36	50 35 36	50 28 36	50 20 35	50 13 36	15
48	50 14 36	50 7 37	49 59 36	49 52 36	49 45 36	49 37 36	12
51	49 38 37	49 30 37	49 23 37	49 16 37	49 9 37	49 1 36	9
54	49 1 38	48 53 37	48 46 37	48 39 37	48 32 37	48 25 37	6
2 57	-48 23 38	-48 16 38	-48 9 38	-48 2 38	-47 55 38	-47 48 38	21 3
3 0	47 45 39	47 38 38	47 31 38	47 24 38	47 17 38	47 10 38	21 0
3	47 6 39	47 0 39	46 53 39	46 46 39	46 39 39	46 32 38	20 57
6	46 27 39	46 21 39	46 14 39	46 7 39	46 0 39	45 54 38	54
9	45 48 40	45 41 40	45 35 40	45 28 40	45 21 39	45 15 40	51
3 12	-45 8 40	-45 1 40	-44 55 40	-44 48 40	-44 42 40	-44 35 40	20 48
15	44 28 41	44 21 41	44 15 41	44 8 41	44 2 41	43 55 40	45
18	43 47 42	43 40 41	43 34 41	43 27 41	43 21 41	43 15 41	42
21	43 5 42	42 59 42	42 53 42	42 46 41	42 40 41	42 34 41	39
24	42 23 42	42 17 42	42 11 42	42 5 42	41 59 42	41 53 42	36
3 27	-41 41 42	-41 35 42	-41 29 42	-41 23 42	-41 17 42	-41 11 42	20 33
30	40 59 43	40 53 43	40 47 43	40 41 43	40 35 43	40 29 43	30
33	40 16 44	40 10 44	40 4 43	39 58 43	39 52 43	39 46 43	27
36	39 32 44	39 26 44	39 21 44	39 15 44	39 9 43	39 3 43	24
39	38 48 44	38 42 44	38 37 44	38 31 44	38 26 44	38 20 43	21
3 42	-38 4 45	-37 58 44	-37 53 45	-37 47 44	-37 42 45	-37 36 44	20 18
45	37 19 45	37 14 45	37 8 45	37 3 45	36 57 44	36 52 45	15
48	36 34 46	36 29 46	36 23 45	36 18 46	36 13 46	36 7 45	12
51	35 48 46	35 43 46	35 38 45	35 33 46	35 28 46	35 22 45	9
54	35 3 46	34 58 46	34 53 46	34 47 45	34 42 45	34 37 45	6
3 57	-34 17 47	-34 12 47	-34 7 47	-34 2 47	-33 57 46	-33 52 46	20 3
4 0	33 30 47	33 25 47	33 20 46	33 15 47	33 11 47	33 6 47	20 0
3	32 43 47	32 38 47	32 34 47	32 29 47	32 24 47	32 19 46	19 57
6	31 56 48	31 51 47	31 47 48	31 42 47	31 37 47	31 33 47	54
4 9	-31 8 48	-31 4 47	-30 59 48	-30 55 47	-30 50 47	-30 46 47	19 51

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1918.

Decl. H. A.	88° 52' 0''	88° 52' 10''	88° 52' 20''	88° 52' 30''	88° 52' 40''	88° 52' 50''	Decl. H. A.
h m	' "	' "	' "	' "	' "	' "	h m
4 9	-31 8	-31 4	-30 59	-30 55	-30 50	-30 46	19 51
12	30 20 ⁴⁸	30 16 ⁴⁸	30 12 ⁴⁷	30 7 ⁴⁸	30 3 ⁴⁸	29 59 ⁴⁸	48
15	29 32 ⁴⁸	29 28 ⁴⁸	29 24 ⁴⁸	29 19 ⁴⁸	29 15 ⁴⁸	29 11 ⁴⁸	45
18	28 43 ⁴⁹	28 40 ⁴⁸	28 36 ⁴⁸	28 31 ⁴⁸	28 27 ⁴⁸	28 23 ⁴⁸	42
21	27 55 ⁴⁹	27 51 ⁴⁹	27 47 ⁴⁹	27 43 ⁴⁸	27 39 ⁴⁹	27 35 ⁴⁸	39
4 24	-27 6 ⁴⁹	-27 2 ⁴⁹	-26 58 ⁴⁹	-26 54 ⁴⁹	-26 50 ⁴⁹	-26 46 ⁴⁸	19 36
27	26 17 ⁵⁰	26 13 ⁴⁹	26 9 ⁴⁹	26 5 ⁴⁹	26 1 ⁴⁹	25 58 ⁴⁹	33
30	25 27 ⁵⁰	25 24 ⁴⁹	25 20 ⁴⁹	25 16 ⁴⁹	25 12 ⁴⁹	25 9 ⁴⁹	30
33	24 37 ⁵⁰	24 34 ⁵⁰	24 30 ⁵⁰	24 27 ⁴⁹	24 23 ⁴⁹	24 20 ⁴⁹	27
36	23 47 ⁵⁰	23 44 ⁵⁰	23 40 ⁵⁰	23 37 ⁵⁰	23 34 ⁵⁰	23 30 ⁵⁰	24
4 39	-22 57 ⁵¹	-22 54 ⁵¹	-22 50 ⁵⁰	-22 47 ⁵⁰	-22 44 ⁵⁰	-22 40 ⁵⁰	19 21
42	22 6 ⁵¹	22 3 ⁵⁰	22 0 ⁵¹	21 57 ⁵¹	21 54 ⁵¹	21 50 ⁵⁰	18
45	21 15 ⁵¹	21 13 ⁵¹	21 9 ⁵⁰	21 6 ⁵⁰	21 3 ⁵⁰	21 0 ⁵⁰	15
48	20 24 ⁵¹	20 22 ⁵¹	20 19 ⁵¹	20 16 ⁵¹	20 13 ⁵¹	20 10 ⁵¹	12
51	19 33 ⁵¹	19 31 ⁵²	19 28 ⁵¹	19 25 ⁵¹	19 22 ⁵¹	19 19 ⁵⁰	9
4 54	-18 42 ⁵²	-18 39 ⁵¹	-18 37 ⁵²	-18 34 ⁵¹	-18 31 ⁵¹	-18 29 ⁵¹	19 6
4 57	17 50 ⁵²	17 48 ⁵²	17 45 ⁵¹	17 43 ⁵²	17 40 ⁵¹	17 38 ⁵²	3
5 0	16 58 ⁵¹	16 56 ⁵²	16 54 ⁵²	16 51 ⁵¹	16 49 ⁵²	16 46 ⁵²	19 0
3	16 7 ⁵²	16 4 ⁵²	16 2 ⁵²	16 0 ⁵²	15 57 ⁵¹	15 55 ⁵¹	18 57
6	15 15 ⁵³	15 12 ⁵²	15 10 ⁵²	15 8 ⁵²	15 6 ⁵²	15 4 ⁵²	54
5 9	-14 22 ⁵²	-14 20 ⁵²	-14 18 ⁵²	-14 16 ⁵²	-14 14 ⁵²	-14 12 ⁵²	18 51
12	13 30 ⁵³	13 28 ⁵³	13 26 ⁵³	13 24 ⁵²	13 22 ⁵²	13 20 ⁵²	48
15	12 37 ⁵³	12 36 ⁵³	12 34 ⁵³	12 32 ⁵²	12 30 ⁵²	12 28 ⁵²	45
18	11 45 ⁵³	11 43 ⁵³	11 41 ⁵²	11 40 ⁵³	11 38 ⁵²	11 36 ⁵²	42
21	10 52 ⁵³	10 50 ⁵²	10 49 ⁵³	10 47 ⁵²	10 46 ⁵²	10 44 ⁵²	39
5 24	- 9 59 ⁵³	- 9 58 ⁵³	- 9 56 ⁵²	- 9 55 ⁵³	- 9 54 ⁵³	- 9 52 ⁵²	18 36
27	9 6 ⁵³	9 5 ⁵³	9 4 ⁵³	9 2 ⁵²	9 1 ⁵³	9 0 ⁵²	33
30	8 13 ⁵³	8 12 ⁵³	8 11 ⁵³	8 10 ⁵³	8 8 ⁵²	8 7 ⁵³	30
33	7 20 ⁵³	7 19 ⁵³	7 18 ⁵³	7 17 ⁵³	7 16 ⁵²	7 15 ⁵²	27
36	6 27 ⁵⁴	6 26 ⁵³	6 25 ⁵³	6 24 ⁵³	6 23 ⁵³	6 22 ⁵²	24
5 39	- 5 33 ⁵³	- 5 33 ⁵³	- 5 32 ⁵³	- 5 31 ⁵³	- 5 30 ⁵²	- 5 30 ⁵³	18 21
42	4 40 ⁵³	4 40 ⁵⁴	4 39 ⁵³	4 38 ⁵³	4 38 ⁵²	4 37 ⁵³	18
45	3 47 ⁵⁴	3 46 ⁵³	3 46 ⁵³	3 45 ⁵³	3 45 ⁵³	3 44 ⁵²	15
48	2 53 ⁵³	2 53 ⁵³	2 53 ⁵³	2 52 ⁵³	2 52 ⁵³	2 52 ⁵³	12
51	2 0 ⁵⁴	2 0 ⁵⁴	2 0 ⁵⁴	1 59 ⁵³	1 59 ⁵³	1 59 ⁵³	9
5 54	- 1 6 ⁵³	- 1 6 ⁵³	- 1 6 ⁵³	- 1 6 ⁵³	- 1 6 ⁵³	- 1 6 ⁵³	18 6
5 57	- 0 13 ⁵³	- 0 13 ⁵³	- 0 13 ⁵³	- 0 13 ⁵³	- 0 13 ⁵³	- 0 13 ⁵²	3
6 0	+ 0 40 ⁵⁴	+ 0 40 ⁵³	+ 0 40 ⁵³	+ 0 40 ⁵³	+ 0 40 ⁵²	+ 0 39 ⁵³	18 0
3	1 34 ⁵³	1 33 ⁵⁴	1 33 ⁵³	1 33 ⁵³	1 32 ⁵²	1 32 ⁵³	17 57
6	2 27 ⁵³	2 27 ⁵⁴	2 26 ⁵³	2 26 ⁵³	2 25 ⁵³	2 25 ⁵³	54
6 9	+ 3 20 ⁵⁴	+ 3 20 ⁵³	+ 3 19 ⁵³	+ 3 19 ⁵³	+ 3 18 ⁵³	+ 3 18 ⁵²	17 51
12	4 14 ⁵³	4 13 ⁵³	4 12 ⁵³	4 12 ⁵²	4 11 ⁵³	4 10 ⁵³	48
15	5 7 ⁵³	5 6 ⁵³	5 5 ⁵³	5 4 ⁵²	5 4 ⁵³	5 3 ⁵³	45
18	6 0 ⁵³	5 59 ⁵³	5 58 ⁵³	5 57 ⁵³	5 56 ⁵²	5 55 ⁵²	42
21	6 53 ⁵³	6 52 ⁵³	6 51 ⁵³	6 50 ⁵³	6 49 ⁵²	6 48 ⁵²	39
6 24	+ 7 46 ⁵³	+ 7 45 ⁵³	+ 7 44 ⁵³	+ 7 43 ⁵²	+ 7 41 ⁵³	+ 7 40 ⁵³	17 36
27	8 39 ⁵³	8 38 ⁵³	8 37 ⁵²	8 35 ⁵²	8 34 ⁵²	8 33 ⁵²	33
30	9 32 ⁵³	9 31 ⁵²	9 29 ⁵³	9 28 ⁵²	9 26 ⁵³	9 25 ⁵²	30
33	10 25 ⁵³	10 23 ⁵³	10 22 ⁵³	10 20 ⁵²	10 19 ⁵²	10 17 ⁵²	27
36	11 18 ⁵²	11 16 ⁵²	11 14 ⁵²	11 12 ⁵²	11 11 ⁵²	11 9 ⁵²	24
6 39	+12 10 ⁵³	+12 8 ⁵³	+12 6 ⁵³	+12 5 ⁵²	+12 3 ⁵²	+12 1 ⁵²	17 21
42	13 3 ⁵²	13 1 ⁵²	12 59 ⁵²	12 57 ⁵¹	12 55 ⁵¹	12 53 ⁵¹	18
45	13 55 ⁵²	13 53 ⁵²	13 51 ⁵¹	13 48 ⁵²	13 46 ⁵²	13 44 ⁵¹	15
48	14 47 ⁵²	14 45 ⁵²	14 42 ⁵²	14 40 ⁵²	14 38 ⁵²	14 36 ⁵²	12
51	15 39 ⁵²	15 37 ⁵¹	15 34 ⁵²	15 32 ⁵¹	15 29 ⁵²	15 27 ⁵¹	9
6 54	+16 31 ⁵¹	+16 28 ⁵²	+16 26 ⁵¹	+16 23 ⁵¹	+16 21 ⁵¹	+16 18 ⁵¹	17 6
6 57	17 22 ⁵¹	17 20 ⁵¹	17 17 ⁵¹	17 14 ⁵¹	17 12 ⁵¹	17 9 ⁵¹	3
7 0	18 14 ⁵²	18 11 ⁵¹	18 8 ⁵¹	18 5 ⁵¹	18 3 ⁵¹	18 0 ⁵¹	17 0
3	19 5 ⁵¹	19 2 ⁵¹	18 59 ⁵¹	18 56 ⁵¹	18 53 ⁵⁰	18 50 ⁵⁰	16 57
7 6	+19 56 ⁵¹	+19 53 ⁵¹	+19 50 ⁵¹	+19 47 ⁵¹	+19 44 ⁵¹	+19 41 ⁵¹	16 54

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1918.

Decl. H. A.	88° 52' 0''	88° 52' 10''	88° 52' 20''	88° 52' 30''	88° 52' 40''	88° 52' 50''	Decl. H. A.
h m	' "	' "	' "	' "	' "	' "	h m
7 6	+19 56 51	+19 53 51	+19 50 51	+19 47 50	+19 44 50	+19 41 50	16 54
7 9	20 47 50	20 44 50	20 41 50	20 37 51	20 34 60	20 31 60	51
12	21 37 51	21 34 50	21 31 50	21 28 50	21 24 50	21 21 50	48
15	22 28 50	22 24 50	22 21 50	22 18 50	22 14 50	22 11 50	45
18	23 18 50	23 14 50	23 11 50	23 7 49	23 4 49	23 0 49	42
7 21	+24 8 49	+24 4 50	+24 1 49	+23 57 49	+23 53 49	+23 50 49	16 39
24	24 57 50	24 54 49	24 50 49	24 46 49	24 42 49	24 39 49	36
27	25 47 49	25 43 49	25 39 49	25 35 49	25 31 49	25 28 49	33
30	26 36 49	26 32 49	26 28 49	26 24 48	26 20 48	26 16 48	30
33	27 25 48	27 21 48	27 17 48	27 12 49	27 8 48	27 4 48	27
7 36	+28 13 49	+28 9 48	+28 5 48	+28 1 48	+27 56 48	+27 52 48	16 24
39	29 2 48	28 57 48	28 53 48	28 49 47	28 44 48	28 40 48	21
42	29 50 47	29 45 48	29 41 47	29 36 47	29 32 47	29 27 47	18
45	30 37 47	30 33 47	30 28 47	30 23 47	30 19 47	30 14 47	15
48	31 24 47	31 20 47	31 15 47	31 10 47	31 6 46	31 1 46	12
7 51	+32 11 47	+32 7 46	+32 2 46	+31 57 46	+31 52 46	+31 47 46	16 9
54	32 58 46	32 53 46	32 48 46	32 43 46	32 38 46	32 33 46	6
7 57	33 44 46	33 39 46	33 34 46	33 29 46	33 24 46	33 19 46	3
8 0	34 30 46	34 25 46	34 20 46	34 15 45	34 10 45	34 5 45	16 0
3	35 16 45	35 11 45	35 6 45	35 0 45	34 55 45	34 50 44	15 57
8 6	+36 1 45	+35 56 45	+35 51 44	+35 45 45	+35 40 44	+35 34 45	15 54
9	36 46 45	36 41 45	36 35 44	36 30 44	36 24 44	36 19 45	51
12	37 31 44	37 25 44	37 19 44	37 14 44	37 8 44	37 3 44	48
15	38 15 44	38 9 44	38 3 44	37 58 43	37 52 43	37 46 43	45
18	38 58 43	38 53 43	38 47 43	38 41 43	38 35 43	38 29 43	42
8 21	+39 42 43	+39 36 43	+39 30 43	+39 24 43	+39 18 43	+39 12 43	15 39
24	40 25 42	40 19 42	40 13 42	40 7 42	40 1 42	39 55 42	36
27	41 7 42	41 1 42	40 55 42	40 49 42	40 43 42	40 37 42	33
30	41 49 42	41 43 42	41 37 42	41 31 41	41 25 42	41 18 41	30
33	42 31 41	42 25 41	42 18 41	42 12 41	42 6 41	41 59 41	27
8 36	+43 12 41	+43 6 41	+42 59 41	+42 53 40	+42 47 40	+42 40 40	15 24
39	43 53 40	43 47 40	43 40 40	43 33 40	43 27 40	43 20 40	21
42	44 33 40	44 27 40	44 20 40	44 13 40	44 7 39	44 0 40	18
45	45 13 39	45 7 39	45 0 39	44 53 39	44 46 39	44 40 39	15
48	45 52 39	45 46 39	45 39 39	45 32 39	45 25 39	45 19 38	12
8 51	+46 31 39	+46 25 38	+46 18 38	+46 11 38	+46 4 38	+45 57 38	15 9
54	47 10 38	47 3 38	46 56 38	46 49 38	46 42 38	46 35 38	6
8 57	47 48 37	47 41 37	47 34 37	47 27 37	47 20 37	47 13 37	3
9 0	48 25 37	48 18 37	48 11 37	48 4 37	47 57 36	47 50 36	15 0
3	49 2 37	48 55 36	48 48 36	48 41 36	48 33 36	48 26 36	14 57
9 6	+49 39 36	+49 31 36	+49 24 36	+49 17 36	+49 9 36	+49 2 36	14 54
9	50 15 35	50 7 36	50 0 35	49 53 35	49 45 35	49 38 35	51
12	50 50 35	50 43 35	50 35 35	50 28 34	50 20 35	50 13 34	48
15	51 25 35	51 18 34	51 10 34	51 2 35	50 55 34	50 47 34	45
18	52 0 34	51 52 34	51 44 34	51 37 33	51 29 33	51 21 34	42
9 21	+52 34 33	+52 26 33	+52 18 33	+52 10 33	+52 2 33	+51 55 33	14 39
24	53 7 33	52 59 33	52 51 33	52 43 33	52 35 33	52 28 33	36
27	53 40 32	53 32 32	53 24 32	53 16 32	53 8 32	53 0 32	33
30	54 12 32	54 4 32	53 56 32	53 48 31	53 40 31	53 32 31	30
33	54 44 31	54 36 31	54 28 31	54 19 31	54 11 31	54 3 31	27
9 36	+55 15 30	+55 7 30	+54 59 30	+54 50 31	+54 42 30	+54 34 30	14 24
39	55 45 30	55 37 30	55 29 30	55 21 30	55 12 30	55 4 30	21
42	56 15 30	56 7 30	55 59 29	55 51 29	55 42 29	55 34 29	18
45	56 45 29	56 37 29	56 28 29	56 20 29	56 11 29	56 3 29	15
48	57 14 28	57 6 28	56 57 28	56 49 28	56 40 28	56 32 28	12
9 51	+57 42 28	+57 34 27	+57 25 28	+57 17 27	+57 8 28	+57 0 27	14 9
54	58 10 27	58 1 27	57 53 27	57 44 27	57 36 27	57 27 27	6
9 57	58 37 27	58 28 27	58 20 26	58 11 26	58 3 26	57 54 26	3
10 0	59 4 26	58 55 26	58 46 26	58 37 26	58 29 25	58 20 26	14 0
10 3	+59 30 26	+59 21 26	+59 12 26	+59 3 26	+58 54 25	+58 46 26	13 57

NDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1918.

88° 52' 0''	88° 52' 10''	88° 52' 20''	88° 52' 30''	88° 52' 40''	88° 52' 50''	Decl. H. A.
' "	' "	' "	' "	' "	' "	h m
+59 30 ²⁵	+59 21 ²⁵	+59 12 ²⁵	+59 3 ²⁵	+58 54 ²⁵	+58 46 ²⁵	13 57
59 55 ²⁵	59 46 ²⁵	59 37 ²⁵	59 28 ²⁵	59 19 ²⁵	59 11 ²⁴	54
60 20 ²⁴	60 11 ²⁴	60 2 ²⁴	59 53 ²⁴	59 44 ²⁴	59 35 ²⁴	51
60 44 ²⁴	60 35 ²⁴	60 26 ²⁴	60 17 ²⁴	60 8 ²⁴	59 59 ²⁴	48
61 7 ²³	60 58 ²³	60 49 ²³	60 40 ²³	60 31 ²³	60 22 ²³	45
+61 30 ²²	+61 21 ²²	+61 12 ²²	+61 3 ²²	+60 54 ²²	+60 45 ²²	13 42
61 52 ²²	61 43 ²²	61 34 ²²	61 25 ²¹	61 16 ²¹	61 7 ²¹	39
62 14 ²¹	62 5 ²¹	61 56 ²¹	61 46 ²¹	61 37 ²¹	61 28 ²¹	36
62 35 ²⁰	62 26 ²⁰	62 17 ²⁰	62 7 ²¹	61 58 ²¹	61 49 ²⁰	33
62 55 ²⁰	62 46 ²⁰	62 37 ²⁰	62 28 ¹⁹	62 18 ²⁰	62 9 ²⁰	30
+63 15 ¹⁹	+63 6 ¹⁹	+62 57 ¹⁹	+62 47 ¹⁹	+62 38 ¹⁹	+62 29 ¹⁸	13 27
63 34 ¹⁹	63 25 ¹⁸	63 16 ¹⁸	63 6 ¹⁸	62 57 ¹⁸	62 47 ¹⁹	24
63 53 ¹⁸	63 43 ¹⁸	63 34 ¹⁸	63 24 ¹⁸	63 15 ¹⁸	63 6 ¹⁹	21
64 11 ¹⁷	64 1 ¹⁷	63 52 ¹⁷	63 42 ¹⁷	63 33 ¹⁷	63 23 ¹⁷	18
64 28 ¹⁶	64 18 ¹⁷	64 9 ¹⁶	63 59 ¹⁷	63 50 ¹⁶	63 40 ¹⁷	15
+64 44 ¹⁶	+64 35 ¹⁶	+64 25 ¹⁶	+64 16 ¹⁵	+64 6 ¹⁶	+63 57 ¹⁵	13 12
65 0 ¹⁵	64 51 ¹⁵	64 41 ¹⁵	64 31 ¹⁵	64 22 ¹⁶	64 12 ¹⁵	9
65 15 ¹⁵	65 6 ¹⁴	64 56 ¹⁵	64 46 ¹⁵	64 37 ¹⁵	64 27 ¹⁵	6
65 30 ¹⁴	65 20 ¹⁴	65 11 ¹⁵	65 1 ¹⁴	64 51 ¹⁴	64 42 ¹⁵	3
65 44 ¹³	65 34 ¹³	65 24 ¹⁴	65 15 ¹³	65 5 ¹³	64 55 ¹³	13 0
+65 57 ¹²	+65 47 ¹²	+65 38 ¹²	+65 28 ¹²	+65 18 ¹³	+65 8 ¹³	12 57
66 9 ¹²	66 0 ¹²	65 50 ¹²	65 40 ¹²	65 31 ¹³	65 21 ¹³	54
66 21 ¹²	66 12 ¹¹	66 2 ¹¹	65 52 ¹¹	65 42 ¹¹	65 33 ¹²	51
66 33 ¹⁰	66 23 ¹⁰	66 13 ¹¹	66 3 ¹¹	65 53 ¹¹	65 44 ¹⁰	48
66 43 ¹⁰	66 33 ¹⁰	66 24 ⁹	66 14 ¹⁰	66 4 ¹⁰	65 54 ¹⁰	45
+66 53 ⁹	+66 43 ⁹	+66 33 ⁹	+66 24 ⁹	+66 14 ⁹	+66 4 ⁹	12 42
67 2 ⁹	66 52 ⁹	66 42 ⁹	66 33 ⁸	66 23 ⁹	66 13 ⁹	39
67 11 ⁸	67 1 ⁹	66 51 ⁹	66 41 ⁸	66 31 ⁸	66 21 ⁸	36
67 19 ⁷	67 9 ⁸	66 59 ⁸	66 49 ⁷	66 39 ⁸	66 29 ⁸	33
67 26 ⁶	67 16 ⁷	67 6 ⁶	66 56 ⁶	66 46 ⁷	66 36 ⁷	30
+67 32 ⁶	+67 22 ⁶	+67 12 ⁶	+67 2 ⁶	+66 52 ⁶	+66 43 ⁵	12 27
67 38 ⁵	67 28 ⁶	67 18 ⁶	67 8 ⁶	66 58 ⁶	66 48 ⁵	24
67 43 ⁵	67 33 ⁵	67 23 ⁵	67 13 ⁵	67 3 ⁵	66 53 ⁵	21
67 48 ⁵	67 38 ⁵	67 28 ⁵	67 18 ⁵	67 8 ⁵	66 58 ⁵	18
67 51 ³	67 41 ³	67 31 ³	67 21 ³	67 12 ⁴	67 2 ⁴	15
+67 54 ³	+67 44 ³	+67 34 ³	+67 24 ³	+67 15 ²	+67 5 ²	12 12
67 57 ²	67 47 ²	67 37 ²	67 27 ²	67 17 ²	67 7 ²	9
67 59 ¹	67 49 ¹	67 39 ¹	67 29 ¹	67 19 ¹	67 9 ¹	6
68 0 ⁰	67 50 ⁰	67 40 ⁰	67 30 ⁰	67 20 ⁰	67 10 ⁰	3
+68 0 ⁰	+67 50 ⁰	+67 40 ⁰	+67 30 ⁰	+67 20 ⁰	+67 10 ⁰	12 0

TABLE Ia.

le I has been computed for an altitude of 45°. For other altitudes, corrections taken following table may be applied when the desired degree of accuracy requires it.

Altitude.	10°	20°	30°	40°	50°	60°	70°	Altitude.	H. A.
h	"	"	"	"	"	"	"	h	h
12	0	0	0	0	0	0	0	12	24
11	- 2	- 2	- 1	0	+ 1	+ 2	+ 4	13	23
10	8	6	4	- 2	2	7	17	14	22
9	16	13	8	3	4	15	35	15	21
8	25	19	13	5	6	22	52	16	20
7	31	24	16	6	7	27	65	17	19
6	- 33	- 25	- 17	- 6	+ 8	+ 29	+ 70	18	18

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0 0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1 0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2 0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3 0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4 0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5 0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6 0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7 0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8 0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9 0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10 0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11 0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12 0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13 0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14 0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15 0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16 0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17 0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18 0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19 0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20 0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21 0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22 0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23 0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24 0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25 0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26 0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27 0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28 0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29 0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30 0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31 0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32 0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33 0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34 0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35 0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36 0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37 0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38 0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39 0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40 0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41 0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42 0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43 0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44 0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45 0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46 0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47 0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48 0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49 0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50 0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51 0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52 0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53 0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54 0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55 0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56 0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57 0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58 0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59 0.161

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

	8 ^h	9 ^h	10 ^h	11 ^h	12 ^h	13 ^h	14 ^h	15 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0 0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1 0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2 0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3 0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4 0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5 0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6 0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7 0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8 0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9 0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10 0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11 0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12 0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13 0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14 0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15 0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16 0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17 0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18 0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19 0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20 0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21 0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22 0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23 0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24 0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25 0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26 0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27 0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28 0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29 0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30 0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31 0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32 0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33 0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34 0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35 0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36 0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37 0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38 0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39 0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40 0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41 0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42 0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43 0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44 0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45 0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46 0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47 0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48 0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49 0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50 0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51 0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52 0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53 0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54 0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55 0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56 0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57 0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58 0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59 0.161

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side- real.	16 ^h	17 ^h	18 ^h	19 ^h	20 ^h	21 ^h	22 ^h	23 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0 0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1 0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2 0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3 0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4 0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5 0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6 0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7 0.019
8	2 38.584	2 48.413	2 58.243	8 0.072	3 17.902	3 27.731	3 37.561	3 47.390	8 0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9 0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10 0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11 0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12 0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13 0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14 0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15 0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16 0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17 0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18 0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19 0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20 0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21 0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22 0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23 0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24 0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25 0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26 0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27 0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28 0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29 0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30 0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31 0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32 0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33 0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34 0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35 0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36 0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37 0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38 0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39 0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40 0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41 0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42 0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43 0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44 0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45 0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46 0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47 0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48 0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49 0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50 0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51 0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52 0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53 0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54 0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55 0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56 0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57 0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58 0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59 0.161

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0 0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1 0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2 0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3 0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4 0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5 0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6 0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7 0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8 0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9 0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10 0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11 0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12 0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13 0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14 0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15 0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16 0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17 0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18 0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19 0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20 0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21 0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22 0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23 0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24 0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25 0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26 0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27 0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28 0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29 0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30 0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31 0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32 0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33 0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34 0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35 0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36 0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37 0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38 0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39 0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40 0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41 0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42 0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43 0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44 0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45 0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46 0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47 0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48 0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49 0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50 0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51 0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52 0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53 0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54 0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55 0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56 0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57 0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58 0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59 0.162

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8 ^h	9 ^h	10 ^h	11 ^h	12 ^h	13 ^h	14 ^h	15 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0 0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1 0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2 0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3 0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4 0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5 0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6 0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7 0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8 0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9 0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10 0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11 0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12 0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13 0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14 0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15 0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16 0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17 0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18 0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19 0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20 0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21 0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22 0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23 0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24 0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25 0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26 0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27 0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28 0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29 0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30 0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31 0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32 0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33 0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34 0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35 0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36 0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37 0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38 0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39 0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40 0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41 0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42 0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43 0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44 0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45 0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46 0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47 0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48 0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49 0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50 0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51 0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52 0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53 0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54 0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55 0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56 0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57 0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58 0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59 0.162

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean solar.	16 ^h	17 ^h	18 ^h	19 ^h	20 ^h	21 ^h	22 ^h	23 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0 0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1 0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2 0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3 0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4 0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5 0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6 0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7 0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8 0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9 0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10 0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11 0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12 0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13 0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14 0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15 0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16 0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17 0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18 0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19 0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20 0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21 0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22 0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23 0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24 0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25 0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26 0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27 0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28 0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29 0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30 0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31 0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32 0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33 0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34 0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35 0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36 0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37 0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38 0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39 0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40 0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41 0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42 0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43 0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44 0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45 0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46 0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47 0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48 0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49 0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50 0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51 0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52 0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53 0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54 0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55 0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56 0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57 0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58 0.158
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59 0.161

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1918.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat. H. A.		10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat. H. A.	
h m		° '	° '	° '	° '	° '	° '	° '	° '	° '	h m	
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0	0
10	0 3.0	0 3.1	0 3.2	0 3.2	0 3.3	0 3.3	0 3.4	0 3.4	0 3.4	0 3.5	23 50	0
20	0 6.0	0 6.1	0 6.3	0 6.4	0 6.5	0 6.6	0 6.8	0 6.8	0 6.9	0 7.0	40	0
30	0 9.0	0 9.2	0 9.5	0 9.6	0 9.8	0 9.9	0 10.1	0 10.1	0 10.3	0 10.5	23 30	0
40	0 12.0	0 12.2	0 12.6	0 12.8	0 13.0	0 13.2	0 13.4	0 13.7	0 13.7	0 14.0	20	0
50	0 14.9	0 15.2	0 15.7	0 15.9	0 16.2	0 16.4	0 16.8	0 16.8	0 17.1	0 17.5	10	0
1 0	0 17.8	0 18.2	0 18.8	0 19.0	0 19.3	0 19.7	0 20.0	0 20.4	0 20.9	0 20.9	23 0	0
10	0 20.7	0 21.2	0 21.8	0 22.1	0 22.4	0 22.8	0 23.3	0 23.7	0 24.3	0 24.3	22 50	0
20	0 23.6	0 24.1	0 24.8	0 25.1	0 25.5	0 26.0	0 26.5	0 27.0	0 27.6	0 27.6	40	0
30	0 26.4	0 26.9	0 27.7	0 28.1	0 28.6	0 29.1	0 29.6	0 30.2	0 30.9	0 30.9	22 30	0
40	0 29.1	0 29.7	0 30.6	0 31.1	0 31.6	0 32.1	0 32.7	0 33.4	0 34.1	0 34.1	20	0
50	0 31.8	0 32.5	0 33.5	0 33.9	0 34.5	0 35.1	0 35.7	0 36.4	0 37.2	0 37.2	10	0
2 0	0 34.5	0 35.2	0 36.2	0 36.7	0 37.3	0 38.0	0 38.7	0 39.4	0 40.3	0 40.3	22 0	0
10	0 37.0	0 37.8	0 38.9	0 39.5	0 40.1	0 40.8	0 41.5	0 42.4	0 43.3	0 43.3	21 50	0
20	0 39.5	0 40.4	0 41.5	0 42.1	0 42.8	0 43.5	0 44.3	0 45.2	0 46.2	0 46.2	40	0
30	0 41.9	0 42.8	0 44.1	0 44.7	0 45.4	0 46.2	0 47.0	0 48.0	0 49.0	0 49.0	21 30	0
40	0 44.3	0 45.2	0 46.5	0 47.2	0 47.9	0 48.7	0 49.7	0 50.7	0 51.8	0 51.8	20	0
50	0 46.5	0 47.5	0 48.9	0 49.6	0 50.4	0 51.2	0 52.2	0 53.2	0 54.4	0 54.4	10	0
3 0	0 48.7	0 49.7	0 51.2	0 51.9	0 52.7	0 53.6	0 54.6	0 55.7	0 56.9	0 56.9	21 0	0
10	0 50.8	0 51.8	0 53.4	0 54.1	0 54.9	0 55.9	0 56.9	0 58.0	0 59.3	0 59.3	20 50	0
20	0 52.8	0 53.8	0 55.4	0 56.2	0 57.1	0 58.0	0 59.1	1 0.3	1 1.6	1 1.6	40	0
30	0 54.6	0 55.8	0 57.4	0 58.2	0 59.1	1 0.1	1 1.2	1 2.4	1 3.8	1 3.8	20 30	0
40	0 56.4	0 57.6	0 59.2	1 0.1	1 1.0	1 2.0	1 3.2	1 4.4	1 5.8	1 5.8	20	0
50	0 58.1	0 59.3	1 1.0	1 1.8	1 2.8	1 3.8	1 5.0	1 6.3	1 7.7	1 7.7	10	0
4 0	0 59.6	1 0.8	1 2.6	1 3.5	1 4.4	1 5.5	1 6.7	1 8.1	1 9.5	1 9.5	20 0	0
10	1 1.0	1 2.3	1 4.1	1 5.0	1 6.0	1 7.1	1 8.3	1 9.7	1 11.2	1 11.2	19 50	0
20	1 2.4	1 3.6	1 5.5	1 6.4	1 7.4	1 8.5	1 9.8	1 11.2	1 12.7	1 12.7	40	0
30	1 3.6	1 4.8	1 6.7	1 7.6	1 8.7	1 9.8	1 11.1	1 12.5	1 14.1	1 14.1	19 30	0
40	1 4.6	1 5.9	1 7.8	1 8.9	1 9.8	1 11.0	1 12.3	1 13.7	1 15.3	1 15.3	20	0
50	1 5.6	1 6.9	1 8.8	1 9.8	1 10.8	1 12.0	1 13.3	1 14.8	1 16.4	1 16.4	10	0
5 0	1 6.4	1 7.8	1 9.7	1 10.6	1 11.7	1 12.9	1 14.2	1 15.7	1 17.3	1 17.3	19 0	0
10	1 7.1	1 8.5	1 10.4	1 11.4	1 12.4	1 13.7	1 15.0	1 16.5	1 18.1	1 18.1	18 50	0
20	1 7.7	1 9.1	1 11.0	1 12.0	1 13.0	1 14.3	1 15.6	1 17.1	1 18.7	1 18.7	40	0
30	1 8.2	1 9.5	1 11.5	1 12.4	1 13.5	1 14.7	1 16.1	1 17.6	1 19.2	1 19.2	18 30	0
40	1 8.5	1 9.8	1 11.8	1 12.7	1 13.8	1 15.1	1 16.4	1 17.9	1 19.6	1 19.6	20	0
50	1 8.7	1 10.0	1 12.0	1 12.9	1 14.0	1 15.3	1 16.6	1 18.1	1 19.8	1 19.8	10	0
6 0	1 8.7	1 10.1	1 12.0	1 13.0	1 14.1	1 15.3	1 16.6	1 18.1	1 19.8	1 19.8	18 0	0
10	1 8.6	1 10.0	1 11.9	1 12.9	1 14.0	1 15.2	1 16.5	1 18.0	1 19.7	1 19.7	17 50	0
20	1 8.4	1 9.8	1 11.7	1 12.7	1 13.7	1 14.9	1 16.3	1 17.8	1 19.4	1 19.4	40	0
30	1 8.1	1 9.4	1 11.3	1 12.3	1 13.4	1 14.6	1 15.9	1 17.4	1 19.0	1 19.0	17 30	0
40	1 7.6	1 8.9	1 10.8	1 11.8	1 12.8	1 14.0	1 15.3	1 16.8	1 18.4	1 18.4	20	0
50	1 7.0	1 8.3	1 10.2	1 11.1	1 12.2	1 13.4	1 14.6	1 16.1	1 17.7	1 17.7	10	0
7 0	1 6.3	1 7.6	1 9.4	1 10.3	1 11.4	1 12.5	1 13.8	1 15.3	1 16.8	1 16.8	17 0	0
10	1 5.5	1 6.7	1 8.5	1 9.4	1 10.5	1 11.6	1 12.9	1 14.3	1 15.8	1 15.8	16 50	0
20	1 4.5	1 5.7	1 7.5	1 8.4	1 9.4	1 10.5	1 11.8	1 13.1	1 14.7	1 14.7	40	0
30	1 3.4	1 4.6	1 6.3	1 7.2	1 8.2	1 9.3	1 10.5	1 11.9	1 13.4	1 13.4	16 30	0
40	1 2.2	1 3.4	1 5.1	1 5.9	1 6.9	1 8.0	1 9.1	1 10.5	1 11.9	1 11.9	20	0
50	1 0.9	1 2.0	1 3.7	1 4.5	1 5.4	1 6.5	1 7.6	1 8.9	1 10.4	1 10.4	10	0
8 0	0 59.4	1 0.5	1 2.1	1 3.0	1 3.9	1 4.9	1 6.0	1 7.3	1 8.7	1 8.7	16 0	0
10	0 57.8	0 58.9	1 0.5	1 1.3	1 2.2	1 3.2	1 4.3	1 5.5	1 6.9	1 6.9	15 50	0
20	0 56.2	0 57.2	0 58.7	0 59.5	1 0.4	1 1.3	1 2.4	1 3.6	1 4.9	1 4.9	40	0
30	0 54.4	0 55.4	0 56.9	0 57.6	0 58.4	0 59.4	1 0.4	1 1.6	1 2.8	1 2.8	15 30	0
40	0 52.5	0 53.5	0 54.9	0 55.6	0 56.4	0 57.3	0 58.3	0 59.4	1 0.6	1 0.6	20	0
50	0 50.5	0 51.5	0 52.8	0 53.5	0 54.3	0 55.1	0 56.1	0 57.2	0 58.3	0 58.3	10	0
9 0	0 48.5	0 49.4	0 50.7	0 51.3	0 52.0	0 52.9	0 53.8	0 54.8	0 55.9	0 55.9	15 0	0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1918.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat.		10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat.	
H. A.											H. A.	
h m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m	° ' "
9 0	0 48.5	0 49.4	0 50.7	0 51.3	0 52.0	0 52.9	0 53.8	0 54.8	0 55.9	15 0	15 0	
10	0 46.3	0 47.1	0 48.4	0 49.0	0 49.7	0 50.5	0 51.4	0 52.3	0 53.4	14 50	14 50	
20	0 44.0	0 44.8	0 46.0	0 46.6	0 47.3	0 48.0	0 48.9	0 49.8	0 50.8	40	40	
9 30	0 41.7	0 42.5	0 43.6	0 44.1	0 44.8	0 45.5	0 46.3	0 47.1	0 48.1	14 30	14 30	
40	0 39.3	0 40.0	0 41.1	0 41.6	0 42.2	0 42.8	0 43.6	0 44.4	0 45.3	20	20	
50	0 36.8	0 37.5	0 38.5	0 39.0	0 39.5	0 40.1	0 40.8	0 41.6	0 42.4	10	10	
10 0	0 34.2	0 34.9	0 35.8	0 36.2	0 36.8	0 37.3	0 38.0	0 38.7	0 39.5	14 0	14 0	
10	0 31.6	0 32.2	0 33.0	0 33.4	0 33.9	0 34.5	0 35.1	0 35.7	0 36.4	13 50	13 50	
20	0 28.9	0 29.5	0 30.2	0 30.6	0 31.1	0 31.5	0 32.1	0 32.7	0 33.3	40	40	
10 30	0 26.2	0 26.7	0 27.4	0 27.7	0 28.1	0 28.6	0 29.0	0 29.6	0 30.2	13 30	13 30	
40	0 23.4	0 23.8	0 24.5	0 24.8	0 25.1	0 25.5	0 26.0	0 26.4	0 27.0	20	20	
50	0 20.6	0 21.0	0 21.5	0 21.8	0 22.1	0 22.4	0 22.8	0 23.2	0 23.7	10	10	
11 0	0 17.7	0 18.0	0 18.5	0 18.7	0 19.0	0 19.3	0 19.6	0 20.0	0 20.4	13 0	13 0	
10	0 14.8	0 15.1	0 15.5	0 15.7	0 15.9	0 16.1	0 16.4	0 16.7	0 17.1	12 50	12 50	
20	0 11.9	0 12.1	0 12.4	0 12.6	0 12.8	0 12.9	0 13.2	0 13.4	0 13.7	40	40	
11 30	0 8.9	0 9.1	0 9.3	0 9.5	0 9.6	0 9.7	0 9.9	0 10.1	0 10.3	12 30	12 30	
40	0 6.0	0 6.1	0 6.2	0 6.3	0 6.4	0 6.5	0 6.6	0 6.7	0 6.9	20	20	
50	0 3.0	0 3.0	0 3.1	0 3.2	0 3.2	0 3.2	0 3.3	0 3.4	0 3.4	10	10	
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0	12 0	

Lat.		32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat.	
H. A.											H. A.	
h m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m	° ' "
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0	24 0
10	0 3.5	0 3.6	0 3.7	0 3.8	0 3.9	0 4.0	0 4.2	0 4.3	0 4.5	23 50	23 50	
20	0 7.0	0 7.2	0 7.4	0 7.6	0 7.8	0 8.1	0 8.4	0 8.7	0 9.0	40	40	
0 30	0 10.5	0 10.8	0 11.1	0 11.4	0 11.7	0 12.1	0 12.5	0 13.0	0 13.5	23 30	23 30	
40	0 14.0	0 14.4	0 14.7	0 15.1	0 15.6	0 16.1	0 16.6	0 17.3	0 17.9	20	20	
50	0 17.5	0 17.9	0 18.4	0 18.9	0 19.4	0 20.1	0 20.7	0 21.5	0 22.3	10	10	
1 0	0 20.9	0 21.4	0 21.9	0 22.6	0 23.2	0 24.0	0 24.8	0 25.7	0 26.7	23 0	23 0	
10	0 24.3	0 24.9	0 25.5	0 26.2	0 27.0	0 27.8	0 28.8	0 29.9	0 31.0	22 50	22 50	
20	0 27.6	0 28.3	0 29.0	0 29.8	0 30.7	0 31.6	0 32.7	0 34.0	0 35.3	40	40	
1 30	0 30.9	0 31.6	0 32.4	0 33.3	0 34.3	0 35.4	0 36.6	0 38.0	0 39.5	22 30	22 30	
40	0 34.1	0 34.9	0 35.8	0 36.8	0 37.9	0 39.1	0 40.4	0 41.9	0 43.6	20	20	
50	0 37.2	0 38.1	0 39.1	0 40.2	0 41.4	0 42.7	0 44.2	0 45.8	0 47.6	10	10	
2 0	0 40.3	0 41.3	0 42.3	0 43.5	0 44.8	0 46.2	0 47.8	0 49.6	0 51.5	22 0	22 0	
10	0 43.3	0 44.4	0 45.5	0 46.7	0 48.1	0 49.6	0 51.4	0 53.2	0 55.3	21 50	21 50	
20	0 46.2	0 47.3	0 48.5	0 49.9	0 51.4	0 53.0	0 54.8	0 56.8	0 59.0	40	40	
2 30	0 49.0	0 50.2	0 51.5	0 52.9	0 54.5	0 56.2	0 58.1	1 0.3	1 2.6	21 30	21 30	
40	0 51.8	0 53.0	0 54.4	0 55.9	0 57.5	0 59.3	1 1.3	1 3.6	1 6.1	20	20	
50	0 54.4	0 55.7	0 57.1	0 58.7	1 0.4	1 2.3	1 4.4	1 6.8	1 9.4	10	10	
3 0	0 56.9	0 58.3	0 59.7	1 1.4	1 3.2	1 5.2	1 7.4	1 9.9	1 12.6	21 0	21 0	
10	0 59.3	1 0.7	1 2.3	1 4.0	1 5.9	1 7.9	1 10.2	1 12.8	1 15.7	20 50	20 50	
20	1 1.6	1 3.1	1 4.7	1 6.4	1 8.4	1 10.5	1 12.9	1 15.6	1 18.6	40	40	
3 30	1 3.8	1 5.3	1 6.9	1 8.8	1 10.8	1 13.0	1 15.5	1 18.2	1 21.3	20 30	20 30	
40	1 5.8	1 7.4	1 9.1	1 11.0	1 13.0	1 15.3	1 17.9	1 20.7	1 23.9	20	20	
50	1 7.7	1 9.3	1 11.1	1 13.0	1 15.2	1 17.5	1 20.1	1 23.0	1 26.3	10	10	
4 0	1 9.5	1 11.2	1 13.0	1 14.9	1 17.1	1 19.6	1 22.2	1 25.2	1 28.5	20 0	20 0	
10	1 11.2	1 12.8	1 14.7	1 16.7	1 18.9	1 21.4	1 24.2	1 27.2	1 30.6	19 50	19 50	
20	1 12.7	1 14.4	1 16.3	1 18.3	1 20.6	1 23.1	1 25.9	1 29.0	1 32.5	40	40	
4 30	1 14.1	1 15.8	1 17.7	1 19.8	1 22.1	1 24.7	1 27.5	1 30.7	1 34.2	19 30	19 30	
40	1 15.3	1 17.0	1 19.0	1 21.1	1 23.5	1 26.1	1 29.0	1 32.2	1 35.7	20	20	
50	1 16.4	1 18.2	1 20.1	1 22.3	1 24.7	1 27.3	1 30.2	1 33.5	1 37.1	10	10	
5 0	1 17.3	1 19.1	1 21.1	1 23.3	1 25.7	1 28.4	1 31.3	1 34.6	1 38.2	19 0	19 0	

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1918.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat. H. A.	32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. H. A.
h m	.	.	.	.	.	.	.	.	.	h m
5 0	1 17.3	1 19.1	1 21.1	1 23.3	1 25.7	1 28.4	1 31.3	1 34.6	1 38.2	19 0
10	1 18.1	1 19.9	1 21.9	1 24.1	1 26.6	1 29.2	1 32.2	1 35.5	1 39.2	18 50
20	1 18.7	1 20.6	1 22.6	1 24.8	1 27.2	1 29.9	1 32.9	1 36.3	1 40.0	40
5 30	1 19.2	1 21.1	1 23.1	1 25.3	1 27.8	1 30.5	1 33.5	1 36.8	1 40.6	18 30
40	1 19.6	1 21.4	1 23.4	1 25.6	1 28.1	1 30.8	1 33.9	1 37.2	1 40.9	20
50	1 19.8	1 21.6	1 23.6	1 25.8	1 28.3	1 31.0	1 34.1	1 37.4	1 41.1	10
6 0	1 19.8	1 21.6	1 23.6	1 25.9	1 28.3	1 31.1	1 34.1	1 37.4	1 41.1	18 0
10	1 19.7	1 21.5	1 23.5	1 25.7	1 28.2	1 30.9	1 33.9	1 37.2	1 40.9	17 50
20	1 19.4	1 21.2	1 23.2	1 25.4	1 27.9	1 30.6	1 33.5	1 36.9	1 40.5	40
6 30	1 19.0	1 20.8	1 22.8	1 25.0	1 27.4	1 30.1	1 33.0	1 36.3	1 40.0	17 30
40	1 18.4	1 20.2	1 22.2	1 24.3	1 26.7	1 29.4	1 32.3	1 35.6	1 39.2	20
50	1 17.7	1 19.5	1 21.4	1 23.6	1 25.9	1 28.6	1 31.5	1 34.7	1 38.3	10
7 0	1 16.8	1 18.6	1 20.5	1 22.6	1 25.0	1 27.6	1 30.4	1 33.6	1 37.1	17 0
10	1 15.8	1 17.5	1 19.4	1 21.5	1 23.8	1 26.4	1 29.2	1 32.3	1 35.8	16 50
20	1 14.7	1 16.3	1 18.2	1 20.3	1 22.5	1 25.1	1 27.8	1 30.9	1 34.3	40
7 30	1 13.4	1 15.0	1 16.8	1 18.9	1 21.1	1 23.6	1 26.3	1 29.3	1 32.6	16 30
40	1 11.9	1 13.6	1 15.3	1 17.3	1 19.5	1 21.9	1 24.6	1 27.5	1 30.8	20
50	1 10.4	1 12.0	1 13.7	1 15.6	1 17.8	1 20.1	1 22.7	1 25.6	1 28.8	10
8 0	1 8.7	1 10.2	1 11.9	1 13.8	1 15.9	1 18.2	1 20.7	1 23.5	1 26.6	16 0
10	1 6.9	1 8.4	1 10.0	1 11.8	1 13.8	1 16.1	1 18.5	1 21.3	1 24.3	15 50
20	1 4.9	1 6.4	1 8.0	1 9.7	1 11.7	1 13.8	1 16.2	1 18.9	1 21.8	40
8 30	1 2.8	1 4.2	1 5.8	1 7.5	1 9.4	1 11.5	1 13.8	1 16.3	1 19.2	15 30
40	1 0.6	1 2.0	1 3.5	1 5.1	1 7.0	1 9.0	1 11.2	1 13.6	1 16.4	20
50	0 58.3	0 59.6	1 1.1	1 2.6	1 4.4	1 6.3	1 8.5	1 10.8	1 13.5	10
9 0	0 55.9	0 57.2	0 58.5	1 0.1	1 1.7	1 3.6	1 5.6	1 7.9	1 10.4	15 0
10	0 53.4	0 54.6	0 55.9	0 57.4	0 59.0	1 0.7	1 2.6	1 4.8	1 7.2	14 50
20	0 50.8	0 51.9	0 53.2	0 54.6	0 56.1	0 57.7	0 59.6	1 1.6	1 3.9	40
9 30	0 48.1	0 49.2	0 50.3	0 51.6	0 53.1	0 54.6	0 56.4	0 58.3	1 0.5	14 30
40	0 45.3	0 46.3	0 47.4	0 48.6	0 50.0	0 51.5	0 53.1	0 54.9	0 57.0	20
50	0 42.4	0 43.4	0 44.4	0 45.5	0 46.8	0 48.2	0 49.7	0 51.4	0 53.3	10
10 0	0 39.5	0 40.3	0 41.3	0 42.4	0 43.5	0 44.8	0 46.3	0 47.8	0 49.6	14 0
10	0 36.4	0 37.2	0 38.1	0 39.1	0 40.2	0 41.4	0 42.7	0 44.2	0 45.8	13 50
20	0 33.3	0 34.1	0 34.9	0 35.8	0 36.8	0 37.9	0 39.1	0 40.4	0 41.9	40
10 30	0 30.2	0 30.9	0 31.6	0 32.4	0 33.3	0 34.3	0 35.4	0 36.6	0 37.9	13 30
40	0 27.0	0 27.6	0 28.2	0 28.9	0 29.8	0 30.6	0 31.6	0 32.7	0 33.9	20
50	0 23.7	0 24.2	0 24.8	0 25.4	0 26.2	0 26.9	0 27.8	0 28.7	0 29.8	10
11 0	0 20.4	0 20.9	0 21.4	0 21.9	0 22.5	0 23.2	0 23.9	0 24.7	0 25.6	13 0
10	0 17.1	0 17.4	0 17.9	0 18.3	0 18.8	0 19.4	0 20.0	0 20.7	0 21.4	12 50
20	0 13.7	0 14.0	0 14.3	0 14.7	0 15.1	0 15.5	0 16.0	0 16.6	0 17.2	40
11 30	0 10.3	0 10.5	0 10.8	0 11.0	0 11.3	0 11.7	0 12.0	0 12.5	0 12.9	12 30
40	0 6.9	0 7.0	0 7.2	0 7.4	0 7.6	0 7.8	0 8.0	0 8.3	0 8.6	20
50	0 3.4	0 3.5	0 3.6	0 3.7	0 3.8	0 3.9	0 4.0	0 4.2	0 4.3	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

Lat. H. A.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. H. A.
h m	.	.	.	.	.	.	.	.	.	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 4.5	0 4.7	0 4.9	0 5.1	0 5.4	0 5.7	0 6.1	0 6.3	0 6.5	23 50
20	0 9.0	0 9.4	0 9.8	0 10.3	0 10.8	0 11.5	0 12.2	0 12.6	0 13.0	40
0 30	0 13.5	0 14.1	0 14.7	0 15.4	0 16.2	0 17.2	0 18.3	0 18.9	0 19.5	23 30
40	0 17.9	0 18.7	0 19.6	0 20.5	0 21.6	0 22.9	0 24.3	0 25.1	0 26.0	20
50	0 22.3	0 23.3	0 24.4	0 25.6	0 26.9	0 28.5	0 30.3	0 31.3	0 32.4	10
1 0	0 26.7	0 27.9	0 29.1	0 30.6	0 32.2	0 34.1	0 36.2	0 37.4	0 38.7	23 0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1918.

* hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat.		48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat.	H. A.
A.												
h	m	°	°	°	°	°	°	°	°	°	h	m
1	0	0 26.7	0 27.9	0 29.1	0 30.6	0 32.2	0 34.1	0 36.2	0 37.4	0 38.7	23	0
	10	0 31.0	0 32.4	0 33.8	0 35.5	0 37.4	0 39.6	0 42.1	0 43.4	0 44.9	22	50
	20	0 35.3	0 36.8	0 38.5	0 40.4	0 42.5	0 45.0	0 47.8	0 49.4	0 51.1		40
1	30	0 39.5	0 41.2	0 43.0	0 45.2	0 47.6	0 50.3	0 53.5	0 55.2	0 57.1	22	30
	40	0 43.6	0 45.4	0 47.5	0 49.8	0 52.5	0 55.5	0 59.0	1 0.9	1 3.0	20	
	50	0 47.6	0 49.6	0 51.9	0 54.4	0 57.3	1 0.6	1 4.4	1 6.5	1 8.8	10	
2	0	0 51.5	0 53.7	0 56.2	0 58.9	1 2.0	1 5.6	1 9.7	1 12.0	1 14.4	22	0
	10	0 55.3	0 57.7	1 0.3	1 3.3	1 6.6	1 10.4	1 14.9	1 17.3	1 19.9	21	50
	20	0 59.0	1 1.5	1 4.3	1 7.5	1 11.1	1 15.1	1 19.9	1 22.4	1 25.2	40	
2	30	1 2.6	1 5.3	1 8.2	1 11.6	1 15.4	1 19.7	1 24.7	1 27.4	1 30.4	21	30
	40	1 6.1	1 8.9	1 12.0	1 15.5	1 19.5	1 24.1	1 29.3	1 32.2	1 35.3	20	
	50	1 9.4	1 12.4	1 15.6	1 19.3	1 23.5	1 28.3	1 33.8	1 36.8	1 40.1	10	
3	0	1 12.6	1 15.7	1 19.1	1 23.0	1 27.3	1 32.3	1 38.0	1 41.2	1 44.6	21	0
	10	1 15.7	1 18.8	1 22.4	1 26.4	1 31.0	1 36.1	1 42.1	1 45.4	1 49.0	20	50
	20	1 18.6	1 21.8	1 25.5	1 29.7	1 34.4	1 39.8	1 46.0	1 49.4	1 53.1	40	
3	30	1 21.3	1 24.7	1 28.5	1 32.8	1 37.7	1 43.3	1 49.6	1 53.2	1 57.0	20	30
	40	1 23.9	1 27.4	1 31.3	1 35.8	1 40.8	1 46.5	1 53.0	1 56.7	2 0.6	20	
	50	1 26.3	1 29.9	1 34.0	1 38.5	1 43.7	1 49.5	1 56.2	2 0.0	2 4.0	10	
4	0	1 28.5	1 32.2	1 36.4	1 41.0	1 46.3	1 52.3	1 59.2	2 3.0	2 7.1	20	0
	10	1 30.6	1 34.4	1 38.6	1 43.4	1 48.8	1 54.9	2 1.9	2 5.8	2 10.0	19	50
	20	1 32.5	1 36.4	1 40.7	1 45.5	1 51.0	1 57.3	2 4.4	2 8.4	2 12.7	40	
4	30	1 34.2	1 38.1	1 42.5	1 47.4	1 53.0	1 59.4	2 6.6	2 10.7	2 15.0	19	30
	40	1 35.7	1 39.7	1 44.2	1 49.2	1 54.8	2 1.3	2 8.6	2 12.7	2 17.1	20	
	50	1 37.1	1 41.1	1 45.6	1 50.7	1 56.4	2 2.9	2 10.4	2 14.5	2 19.0	10	
5	0	1 38.2	1 42.3	1 46.9	1 52.0	1 57.8	2 4.3	2 11.8	2 16.0	2 20.5	19	0
	10	1 39.2	1 43.3	1 47.9	1 53.0	1 58.9	2 5.5	2 13.1	2 17.3	2 21.8	18	50
	20	1 40.0	1 44.1	1 48.7	1 53.9	1 59.8	2 6.4	2 14.0	2 18.3	2 22.8	40	
5	30	1 40.6	1 44.7	1 49.3	1 54.5	2 0.4	2 7.1	2 14.7	2 19.0	2 23.5	18	30
	40	1 40.9	1 45.1	1 49.7	1 55.0	2 0.9	2 7.5	2 15.2	2 19.4	2 24.0	20	
	50	1 41.1	1 45.3	1 49.9	1 55.2	2 1.1	2 7.7	2 15.4	2 19.6	2 24.2	10	
6	0	1 41.1	1 45.3	1 49.9	1 55.1	2 1.0	2 7.7	2 15.3	2 19.5	2 24.1	18	0
	10	1 40.9	1 45.1	1 49.7	1 54.9	2 0.7	2 7.4	2 15.0	2 19.2	2 23.7	17	50
	20	1 40.5	1 44.7	1 49.2	1 54.4	2 0.2	2 6.9	2 14.4	2 18.6	2 23.1	40	
6	30	1 40.0	1 44.1	1 48.6	1 53.7	1 59.5	2 6.1	2 13.5	2 17.7	2 22.2	17	30
	40	1 39.2	1 43.3	1 47.8	1 52.8	1 58.6	2 5.1	2 12.4	2 16.5	2 21.0	20	
	50	1 38.3	1 42.3	1 46.7	1 51.7	1 57.4	2 3.8	2 11.1	2 15.2	2 19.5	10	
7	0	1 37.1	1 41.1	1 45.5	1 50.4	1 56.0	2 2.3	2 9.5	2 13.5	2 17.8	17	0
	10	1 35.8	1 39.7	1 44.0	1 48.9	1 54.4	2 0.6	2 7.7	2 11.6	2 15.9	16	50
	20	1 34.3	1 38.1	1 42.4	1 47.2	1 52.6	1 58.7	2 5.7	2 9.5	2 13.7	40	
7	30	1 32.6	1 36.4	1 40.6	1 45.3	1 50.6	1 56.6	2 3.4	2 7.2	2 11.3	16	30
	40	1 30.8	1 34.5	1 38.6	1 43.1	1 48.3	1 54.2	2 0.9	2 4.6	2 8.6	20	
	50	1 28.8	1 32.4	1 36.4	1 40.8	1 45.9	1 51.6	1 58.2	2 1.8	2 5.7	10	
8	0	1 26.6	1 30.1	1 34.0	1 38.3	1 43.3	1 48.8	1 55.2	1 58.7	2 2.5	16	0
	10	1 24.3	1 27.7	1 31.4	1 35.7	1 40.5	1 45.9	1 52.1	1 55.5	1 59.2	15	50
	20	1 21.8	1 25.1	1 28.7	1 32.8	1 37.5	1 42.7	1 48.7	1 52.0	1 55.6	40	
8	30	1 19.2	1 22.3	1 25.9	1 29.8	1 34.3	1 39.4	1 45.2	1 48.4	1 51.8	15	30
	40	1 16.4	1 19.4	1 22.8	1 26.7	1 31.0	1 35.8	1 41.4	1 44.5	1 47.8	20	
	50	1 13.5	1 16.4	1 19.6	1 23.3	1 27.5	1 32.1	1 37.5	1 40.5	1 43.6	10	
9	0	1 10.4	1 13.2	1 16.3	1 19.8	1 23.8	1 28.3	1 33.4	1 36.3	1 39.3	15	0
	10	1 7.2	1 9.9	1 12.9	1 16.2	1 20.0	1 24.3	1 29.2	1 31.9	1 34.8	14	50
	20	1 3.9	1 6.5	1 9.3	1 12.5	1 16.1	1 20.1	1 24.8	1 27.3	1 30.1	40	
9	30	1 0.5	1 2.9	1 5.6	1 8.6	1 12.0	1 15.8	1 20.2	1 22.6	1 25.2	14	30
	40	0 57.0	0 59.2	1 1.7	1 4.6	1 7.7	1 11.4	1 15.5	1 17.8	1 20.2	20	
	50	0 53.3	0 55.4	0 57.8	1 0.4	1 3.4	1 6.8	1 10.7	1 12.8	1 15.1	10	
10	0	0 49.6	0 51.6	0 53.8	0 56.2	0 59.0	1 2.1	1 5.7	1 7.7	1 9.8	14	0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1918.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat. H. A.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. H. A.
h m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m
10 0	0 49.6	0 51.6	0 53.8	0 56.2	0 59.0	1 2.1	1 5.7	1 7.7	1 9.8	14 0
10 10	0 45.8	0 47.6	0 49.6	0 51.9	0 54.4	0 57.3	1 0.7	1 2.5	1 4.4	13 50
10 20	0 41.9	0 43.5	0 45.4	0 47.5	0 49.8	0 52.4	0 55.5	0 57.2	0 58.9	40
10 30	0 37.9	0 39.4	0 41.1	0 43.0	0 45.1	0 47.4	0 50.2	0 51.7	0 53.3	13 30
10 40	0 33.9	0 35.2	0 36.7	0 38.4	0 40.3	0 42.4	0 44.8	0 46.2	0 47.6	20
10 50	0 29.8	0 30.9	0 32.2	0 33.7	0 35.4	0 37.2	0 39.4	0 40.6	0 41.9	10
11 0	0 25.6	0 26.6	0 27.8	0 29.0	0 30.4	0 32.0	0 33.9	0 34.9	0 36.0	13 0
11 10	0 21.4	0 22.3	0 23.2	0 24.3	0 25.4	0 26.8	0 28.3	0 29.2	0 30.1	12 50
11 20	0 17.2	0 17.9	0 18.6	0 19.5	0 20.4	0 21.5	0 22.7	0 23.4	0 24.1	40
11 30	0 12.9	0 13.4	0 14.0	0 14.6	0 15.3	0 16.2	0 17.1	0 17.6	0 18.1	12 30
11 40	0 8.6	0 9.0	0 9.3	0 9.8	0 10.2	0 10.8	0 11.4	0 11.8	0 12.1	20
11 50	0 4.3	0 4.5	0 4.7	0 4.9	0 5.1	0 5.4	0 5.7	0 5.9	0 6.1	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

Lat. H. A.	62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat. H. A.
h m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
0 10	0 6.5	0 6.8	0 7.0	0 7.3	0 7.6	0 7.9	0 8.3	0 8.7	0 9.1	23 50
0 20	0 13.0	0 13.5	0 14.0	0 14.6	0 15.2	0 15.8	0 16.6	0 17.3	0 18.2	40
0 30	0 19.5	0 20.2	0 21.0	0 21.8	0 22.7	0 23.7	0 24.8	0 26.0	0 27.3	23 30
0 40	0 26.0	0 26.9	0 27.9	0 29.0	0 30.2	0 31.5	0 33.0	0 34.5	0 36.3	20
0 50	0 32.4	0 33.5	0 34.8	0 36.1	0 37.6	0 39.3	0 41.1	0 43.0	0 45.2	10
1 0	0 38.7	0 40.1	0 41.6	0 43.2	0 45.0	0 46.9	0 49.1	0 51.4	0 54.0	23 0
1 10	0 44.9	0 46.5	0 48.3	0 50.2	0 52.2	0 54.5	0 57.0	0 59.7	1 2.7	22 50
1 20	0 51.1	0 52.9	0 54.9	0 57.0	0 59.4	1 1.9	1 4.7	1 7.8	1 11.3	40
1 30	0 57.1	0 59.1	1 1.4	1 3.8	1 6.4	1 9.2	1 12.4	1 15.8	1 19.7	22 30
1 40	1 3.0	1 5.3	1 7.7	1 10.4	1 13.2	1 16.4	1 19.9	1 23.7	1 27.9	20
1 50	1 8.8	1 11.3	1 13.9	1 16.8	1 19.9	1 23.4	1 27.2	1 31.3	1 35.9	10
2 0	1 14.4	1 17.1	1 20.0	1 23.1	1 26.5	1 30.2	1 34.3	1 38.8	1 43.8	22 0
2 10	1 19.9	1 22.8	1 25.9	1 29.2	1 32.8	1 36.8	1 41.2	1 46.0	1 51.4	21 50
2 20	1 25.2	1 28.3	1 31.6	1 35.1	1 39.0	1 43.2	1 47.9	1 53.0	1 58.7	40
2 30	1 30.4	1 33.6	1 37.1	1 40.8	1 44.9	1 49.4	1 54.4	1 59.8	2 5.8	21 30
2 40	1 35.3	1 38.7	1 42.4	1 46.3	1 50.7	1 55.4	2 0.6	2 6.3	2 12.6	20
2 50	1 40.1	1 43.6	1 47.5	1 51.6	1 56.2	2 1.1	2 6.5	2 12.5	2 19.2	10
3 0	1 44.6	1 48.3	1 52.3	1 56.7	2 1.4	2 6.6	2 12.2	2 18.5	2 25.4	21 0
3 10	1 49.0	1 52.8	1 57.0	2 1.5	2 6.4	2 11.8	2 17.6	2 24.1	2 31.3	20 50
3 20	1 53.1	1 57.1	2 1.4	2 6.0	2 11.1	2 16.7	2 22.8	2 29.5	2 36.9	40
3 30	1 57.0	2 1.1	2 5.5	2 10.3	2 15.6	2 21.3	2 27.6	2 34.5	2 42.2	20 30
3 40	2 0.6	2 4.8	2 9.4	2 14.3	2 19.8	2 25.7	2 32.2	2 39.3	2 47.1	20
3 50	2 4.0	2 8.3	2 13.0	2 18.1	2 23.7	2 29.7	2 36.4	2 43.7	2 51.7	10
4 0	2 7.1	2 11.6	2 16.4	2 21.6	2 27.3	2 33.5	2 40.2	2 47.7	2 56.0	20 0
4 10	2 10.0	2 14.6	2 19.5	2 24.8	2 30.6	2 36.9	2 43.8	2 51.4	2 59.8	19 50
4 20	2 12.7	2 17.3	2 22.3	2 27.7	2 33.6	2 40.0	2 47.0	2 54.8	3 3.4	40
4 30	2 15.0	2 19.7	2 24.8	2 30.3	2 36.3	2 42.8	2 49.9	2 57.8	3 6.5	19 30
4 40	2 17.1	2 21.9	2 27.0	2 32.6	2 38.6	2 45.3	2 52.5	3 0.5	3 9.3	20
4 50	2 19.0	2 23.8	2 29.0	2 34.6	2 40.7	2 47.4	2 54.7	3 2.8	3 11.6	10
5 0	2 20.5	2 25.4	2 30.6	2 36.3	2 42.5	2 49.2	2 56.6	3 4.7	3 13.6	19 0
5 10	2 21.8	2 26.7	2 32.0	2 37.7	2 43.9	2 50.7	2 58.1	3 6.3	3 15.3	18 50
5 20	2 22.8	2 27.7	2 33.0	2 38.8	2 45.0	2 51.8	2 59.3	3 7.5	3 16.5	40
5 30	2 23.5	2 28.4	2 33.8	2 39.5	2 45.8	2 52.6	3 0.1	3 8.3	3 17.4	18 30
5 40	2 24.0	2 28.9	2 34.2	2 40.0	2 46.3	2 53.1	3 0.6	3 8.8	3 17.8	20
5 50	2 24.2	2 29.1	2 34.4	2 40.2	2 46.4	2 53.2	3 0.7	3 8.9	3 17.9	10
6 0	2 24.1	2 29.0	2 34.3	2 40.0	2 46.3	2 53.0	3 0.5	3 8.6	3 17.6	18 0

TABLE IV.

703

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1918.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat.		62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat.	
H. A.											H. A.	
h m	° '	° '	° '	° '	° '	° '	° '	° '	° '	° '	h m	° '
6 0	2 24.1	2 29.0	2 34.3	2 40.0	2 46.3	2 53.0	3 0.5	3 8.6	3 17.6	18 0		
10	2 23.7	2 28.6	2 33.9	2 39.6	2 45.8	2 52.5	2 59.9	3 8.0	3 17.0	17 50		
20	2 23.1	2 27.9	2 33.1	2 38.8	2 45.0	2 51.7	2 59.0	3 7.1	3 16.0	40		
6 30	2 22.2	2 27.0	2 32.2	2 37.8	2 43.9	2 50.5	2 57.8	3 5.8	3 14.6	17 30		
40	2 21.0	2 25.7	2 30.9	2 36.4	2 42.5	2 49.1	2 56.3	3 4.2	3 12.8	20		
50	2 19.5	2 24.2	2 29.3	2 34.8	2 40.8	2 47.3	2 54.4	3 2.2	3 10.7	10		
7 0	2 17.8	2 22.5	2 27.5	2 32.9	2 38.8	2 45.2	2 52.2	2 59.8	3 8.3	17 0		
10	2 15.9	2 20.5	2 25.4	2 30.7	2 36.5	2 42.8	2 49.7	2 57.2	3 5.5	16 50		
20	2 13.7	2 18.2	2 23.0	2 28.2	2 33.9	2 40.1	2 46.8	2 54.2	3 2.4	40		
7 30	2 11.3	2 15.6	2 20.4	2 25.5	2 31.1	2 37.1	2 43.7	2 51.0	2 58.9	16 30		
40	2 8.6	2 12.9	2 17.5	2 22.5	2 27.9	2 33.8	2 40.3	2 47.4	2 55.2	20		
50	2 5.7	2 9.8	2 14.4	2 19.2	2 24.5	2 30.3	2 36.6	2 43.5	2 51.1	10		
8 0	2 2.5	2 6.6	2 11.0	2 15.7	2 20.9	2 26.5	2 32.6	2 39.3	2 46.7	16 0		
10	1 59.2	2 3.1	2 7.4	2 12.0	2 17.0	2 22.4	2 28.4	2 34.9	2 42.0	15 50		
20	1 55.6	1 59.4	2 3.5	2 8.0	2 12.9	2 18.1	2 23.9	2 30.2	2 37.1	40		
8 30	1 51.8	1 55.5	1 59.5	2 3.8	2 8.5	2 13.6	2 19.1	2 25.2	2 31.9	15 30		
40	1 47.8	1 51.4	1 55.2	1 59.4	2 3.9	2 8.8	2 14.1	2 20.0	2 26.4	20		
50	1 43.6	1 47.1	1 50.8	1 54.7	1 59.1	2 3.8	2 8.9	2 14.5	2 20.7	10		
9 0	1 39.3	1 42.6	1 46.1	1 49.9	1 54.0	1 58.5	2 3.4	2 8.8	2 14.7	15 0		
10	1 34.8	1 37.9	1 41.2	1 44.9	1 48.8	1 53.1	1 57.8	2 2.9	2 8.5	14 50		
20	1 30.1	1 33.0	1 36.2	1 39.7	1 43.4	1 47.5	1 51.9	1 56.8	2 2.1	40		
9 30	1 25.2	1 28.0	1 31.0	1 34.3	1 37.8	1 41.7	1 45.8	1 50.4	1 55.5	14 30		
40	1 20.2	1 22.9	1 25.7	1 28.8	1 32.1	1 35.7	1 39.6	1 43.9	1 48.6	20		
50	1 15.1	1 17.6	1 20.2	1 23.1	1 26.2	1 29.5	1 33.2	1 37.2	1 41.6	10		
10 0	1 9.8	1 12.1	1 14.6	1 17.2	1 20.1	1 23.2	1 26.7	1 30.4	1 34.5	14 0		
10	1 4.4	1 6.5	1 8.8	1 11.3	1 13.9	1 16.8	1 20.0	1 23.4	1 27.2	13 50		
20	0 58.9	1 0.9	1 2.9	1 5.2	1 7.6	1 10.2	1 13.1	1 16.3	1 19.7	40		
10 30	0 53.3	0 55.1	0 57.0	0 59.0	1 1.2	1 3.6	1 6.2	1 9.0	1 12.1	13 30		
40	0 47.6	0 49.2	0 50.9	0 52.7	0 54.6	0 56.8	0 59.1	1 1.6	1 4.4	20		
50	0 41.9	0 43.2	0 44.7	0 46.3	0 48.0	0 49.9	0 51.9	0 54.1	0 56.6	10		
11 0	0 36.0	0 37.2	0 38.5	0 39.8	0 41.3	0 42.9	0 44.7	0 46.6	0 48.7	13 0		
10	0 30.1	0 31.1	0 32.2	0 33.3	0 34.5	0 35.9	0 37.3	0 38.9	0 40.7	12 50		
20	0 24.1	0 24.9	0 25.8	0 26.7	0 27.7	0 28.8	0 29.9	0 31.2	0 32.6	40		
11 30	0 18.1	0 18.7	0 19.4	0 20.1	0 20.8	0 21.6	0 22.5	0 23.5	0 24.5	12 30		
40	0 12.1	0 12.5	0 12.9	0 13.4	0 13.9	0 14.4	0 15.0	0 15.7	0 16.4	20		
50	0 6.1	0 6.3	0 6.5	0 6.7	0 7.0	0 7.2	0 7.5	0 7.8	0 8.2	10		
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0		

TABLE IVa.

Table IV has been computed for a declination of 88° 52' 20". For other declinations of Polaris the correction given below should be applied to the Azimuth taken from Table IV.

Azimuth.		0'	20'	40'	60'	80'	100'	120'	140'	160'	180'	200'	Azimuth.	
Decl.													Decl.	
° ' "													° ' "	
88 51 55	0.0	+0.1	+0.2	+0.4	+0.5	+0.6	+0.7	+0.8	+1.0	+1.1	+1.2		88 51 55	
88 52 0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		88 52 0	
88 52 5	0.0	+0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7		88 52 5	
88 52 10	0.0	0.0	+0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5		88 52 10	
88 52 15	0.0	0.0	0.0	+0.1	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2		88 52 15	
88 52 20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		88 52 20	
88 52 25	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2		88 52 25	
88 52 30	0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.5		88 52 30	
88 52 35	0.0	-0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7		88 52 35	
88 52 40	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		88 52 40	
88 52 45	0.0	-0.1	-0.2	-0.4	-0.5	-0.6	-0.7	-0.8	-1.0	-1.1	-1.2		88 52 45	

AZIMUTH OF POLARIS AT ELONGATION, 1918.

Lat.	Long.					Variation in—	
	55° 52' 0"	55° 52' 10"	55° 52' 20"	55° 52' 30"	55° 52' 40"	55° 52' 50"	1 of Lat. 1 of L.
10 0	1 9 2.9	1 8 52.8	1 8 42.6	1 8 32.5	1 8 22.3	1 8 12.2	-0.21 -1.01
10 20	1 9 7.3	1 8 57.1	1 8 46.9	1 8 36.8	1 8 26.6	1 8 16.4	0.22 1.02
10 40	1 9 11.8	1 9 1.6	1 8 51.4	1 8 41.2	1 8 31.0	1 8 20.9	0.23 1.02
11 0	1 9 16.4	1 9 6.2	1 8 56.0	1 8 45.8	1 8 35.6	1 8 25.4	0.23 1.02
11 20	1 9 21.2	1 9 11.0	1 9 0.8	1 8 50.6	1 8 40.4	1 8 30.2	0.24 1.02
11 40	1 9 26.1	1 9 15.9	1 9 5.7	1 8 55.5	1 8 45.2	1 8 35.0	-0.25 -1.02
12 0	1 9 31.2	1 9 20.9	1 9 10.7	1 9 0.5	1 8 50.3	1 8 40.0	0.26 1.02
12 20	1 9 36.4	1 9 26.2	1 9 15.9	1 9 5.7	1 8 55.5	1 8 45.2	0.26 1.02
12 40	1 9 41.8	1 9 31.5	1 9 21.3	1 9 11.0	1 9 0.8	1 8 50.5	0.27 1.03
13 0	1 9 47.3	1 9 37.1	1 9 26.8	1 9 16.5	1 9 6.3	1 8 56.0	0.28 1.03
13 20	1 9 53.0	1 9 42.8	1 9 32.5	1 9 22.2	1 9 11.9	1 9 1.6	-0.29 -1.03
13 40	1 9 58.9	1 9 48.6	1 9 38.3	1 9 28.0	1 9 17.7	1 9 7.4	0.30 1.03
14 0	1 10 4.9	1 9 54.6	1 9 44.3	1 9 34.0	1 9 23.7	1 9 13.4	0.30 1.03
14 20	1 10 11.1	1 10 0.8	1 9 50.5	1 9 40.1	1 9 29.8	1 9 19.5	0.31 1.03
14 40	1 10 17.4	1 10 7.1	1 9 56.8	1 9 46.4	1 9 36.1	1 9 25.8	0.32 1.03
15 0	1 10 23.9	1 10 13.6	1 10 3.2	1 9 52.9	1 9 42.5	1 9 32.2	+0.33 -1.03
15 20	1 10 30.6	1 10 20.2	1 10 9.9	1 9 59.5	1 9 49.1	1 9 38.8	0.34 1.04
15 40	1 10 37.4	1 10 27.1	1 10 16.7	1 10 6.3	1 9 55.9	1 9 45.5	0.34 1.04
16 0	1 10 44.4	1 10 34.0	1 10 23.6	1 10 13.2	1 10 2.8	1 9 52.4	0.35 1.04
16 20	1 10 51.6	1 10 41.2	1 10 30.8	1 10 20.3	1 10 9.9	1 9 59.5	0.36 1.04
16 40	1 10 58.9	1 10 48.5	1 10 38.1	1 10 27.6	1 10 17.2	1 10 6.8	+0.37 -1.04
17 0	1 11 6.4	1 10 56.0	1 10 45.5	1 10 35.1	1 10 24.6	1 10 14.2	0.38 1.04
17 20	1 11 14.1	1 11 3.6	1 10 53.2	1 10 42.7	1 10 32.2	1 10 21.7	0.39 1.05
17 40	1 11 22.0	1 11 11.5	1 11 1.0	1 10 50.5	1 10 40.0	1 10 29.5	0.40 1.05
18 0	1 11 30.0	1 11 19.5	1 11 9.0	1 10 58.5	1 10 47.9	1 10 37.4	0.40 1.05
18 20	1 11 38.2	1 11 27.7	1 11 17.1	1 11 6.6	1 10 56.1	1 10 45.5	+0.41 -1.05
18 40	1 11 46.6	1 11 36.0	1 11 25.5	1 11 14.9	1 11 4.4	1 10 53.8	0.42 1.06
19 0	1 11 55.1	1 11 44.5	1 11 34.0	1 11 23.4	1 11 12.8	1 11 2.2	0.43 1.06
19 20	1 12 3.9	1 11 53.3	1 11 42.7	1 11 32.1	1 11 21.5	1 11 10.9	0.44 1.06
19 40	1 12 12.8	1 12 2.2	1 11 51.5	1 11 40.9	1 11 30.3	1 11 19.7	0.45 1.06
20 0	1 12 21.9	1 12 11.2	1 12 0.6	1 11 50.0	1 11 39.3	1 11 28.7	+0.46 -1.06
20 20	1 12 31.2	1 12 20.5	1 12 0.8	1 11 59.2	1 11 48.5	1 11 37.8	0.47 1.07
20 40	1 12 40.7	1 12 30.0	1 12 19.3	1 12 8.6	1 11 57.9	1 11 47.2	0.48 1.07
21 0	1 12 50.3	1 12 39.6	1 12 28.9	1 12 18.2	1 12 7.5	1 11 56.8	0.48 1.07
21 20	1 13 0.2	1 12 49.4	1 12 38.7	1 12 28.0	1 12 17.2	1 12 6.5	0.49 1.07
21 40	1 13 10.2	1 12 59.5	1 12 48.7	1 12 37.9	1 12 27.2	1 12 16.4	+0.50 -1.08
22 0	1 13 20.5	1 13 9.7	1 12 58.9	1 12 48.1	1 12 37.3	1 12 26.5	0.51 1.08
22 20	1 13 30.9	1 13 20.1	1 13 9.3	1 12 58.5	1 12 47.7	1 12 36.9	0.52 1.08
22 40	1 13 41.6	1 13 30.7	1 13 19.9	1 13 9.0	1 12 58.2	1 12 47.4	0.53 1.08
23 0	1 13 52.4	1 13 41.5	1 13 30.7	1 13 19.8	1 13 8.9	1 12 58.1	0.54 1.09
23 20	1 14 3.4	1 13 52.6	1 13 41.7	1 13 30.8	1 13 19.9	1 13 9.0	+0.55 -1.09
23 40	1 14 14.7	1 14 3.8	1 13 52.9	1 13 42.0	1 13 31.0	1 13 20.1	0.56 1.09
24 0	1 14 26.2	1 14 15.2	1 14 4.3	1 13 53.3	1 13 42.4	1 13 31.4	0.57 1.10
24 20	1 14 37.9	1 14 26.9	1 14 15.9	1 14 4.9	1 13 53.9	1 13 43.0	0.58 1.10
24 40	1 14 49.7	1 14 38.7	1 14 27.7	1 14 16.7	1 14 5.7	1 13 54.7	0.60 1.10
25 0	1 15 1.8	1 14 50.8	1 14 39.8	1 14 28.7	1 14 17.7	1 14 6.7	+0.61 -1.10
25 20	1 15 14.2	1 15 3.1	1 14 52.0	1 14 41.0	1 14 29.9	1 14 18.8	0.62 1.11
25 40	1 15 26.7	1 15 15.6	1 15 4.5	1 14 53.4	1 14 42.3	1 14 31.2	0.63 1.11
26 0	1 15 39.5	1 15 28.4	1 15 17.2	1 15 6.1	1 14 55.0	1 14 43.8	0.64 1.11
26 20	1 15 52.5	1 15 41.3	1 15 30.2	1 15 19.0	1 15 7.8	1 14 56.7	0.65 1.12
26 40	1 16 5.7	1 15 54.5	1 15 43.3	1 15 32.1	1 15 20.9	1 15 9.8	+0.66 -1.12
27 0	1 16 19.2	1 16 7.9	1 15 56.7	1 15 45.5	1 15 34.3	1 15 23.1	0.68 1.12
27 20	1 16 32.9	1 16 21.0	1 16 10.3	1 15 59.1	1 15 47.8	1 15 36.6	0.69 1.13
27 40	1 16 46.8	1 16 35.5	1 16 24.2	1 16 12.9	1 16 1.6	1 15 50.3	0.70 1.13
28 0	1 17 1.0	1 16 49.6	1 16 38.3	1 16 27.0	1 16 15.7	1 16 4.3	0.71 1.13
28 20	1 17 15.1	1 17 4.0	1 16 52.7	1 16 41.3	1 16 29.9	1 16 18.6	+0.72 -1.14
28 40	1 17 30.1	1 17 18.7	1 17 7.3	1 16 55.9	1 16 44.5	1 16 33.1	0.74 1.14
29 0	1 17 45.0	1 17 33.5	1 17 22.1	1 17 10.7	1 16 59.2	1 16 47.8	0.75 1.14
29 20	1 18 0.2	1 17 48.7	1 17 37.2	1 17 25.7	1 17 14.3	1 17 2.8	0.76 1.15
29 40	1 18 15.6	1 18 4.1	1 17 52.6	1 17 41.0	1 17 29.5	1 17 18.0	0.77 1.15
30 0	1 18 31.3	1 18 19.7	1 18 8.2	1 17 56.6	1 17 45.1	1 17 33.5	+0.79 -1.16

TABLE V.

705

AZIMUTH OF POLARIS AT ELONGATION, 1918.

ecl. /							Variation for—	
	88° 52' 0"	88° 52' 10"	88° 52' 20"	88° 52' 30"	88° 52' 40"	88° 52' 50"	1' of Lat.	1" of a.
0	1 18 31.3	1 18 19.7	1 18 8.2	1 17 56.6	1 17 45.1	1 17 33.5	+0.79	-1.16
10	1 18 39.2	1 18 27.7	1 18 16.1	1 18 4.5	1 17 53.0	1 17 41.4	0.80	1.16
20	1 18 47.2	1 18 35.7	1 18 24.1	1 18 12.5	1 18 0.9	1 17 49.3	0.80	1.16
30	1 18 55.3	1 18 43.7	1 18 32.1	1 18 20.5	1 18 8.9	1 17 57.3	0.81	1.16
40	1 19 3.5	1 18 51.8	1 18 40.2	1 18 28.6	1 18 17.0	1 18 5.3	0.82	1.16
50	1 19 11.7	1 19 0.0	1 18 48.4	1 18 36.8	1 18 25.1	1 18 13.5	+0.82	-1.16
0	1 19 20.0	1 19 8.3	1 18 56.6	1 18 45.0	1 18 33.3	1 18 21.6	0.83	1.17
10	1 19 28.3	1 19 16.6	1 19 4.9	1 18 53.3	1 18 41.6	1 18 29.9	0.83	1.17
20	1 19 36.8	1 19 25.0	1 19 13.3	1 19 1.6	1 18 49.9	1 18 38.2	0.84	1.17
30	1 19 45.3	1 19 33.5	1 19 21.8	1 19 10.1	1 18 58.3	1 18 46.6	0.85	1.17
40	1 19 53.8	1 19 42.1	1 19 30.3	1 19 18.6	1 19 6.8	1 18 55.1	+0.86	-1.17
50	1 20 2.5	1 19 50.7	1 19 38.9	1 19 27.2	1 19 15.4	1 19 3.6	0.86	1.18
0	1 20 11.2	1 19 59.4	1 19 47.6	1 19 35.8	1 19 24.0	1 19 12.2	0.87	1.18
10	1 20 19.9	1 20 8.1	1 19 56.3	1 19 44.5	1 19 32.7	1 19 20.9	0.88	1.18
20	1 20 28.8	1 20 17.0	1 20 5.1	1 19 53.3	1 19 41.5	1 19 29.6	0.88	1.18
30	1 20 37.7	1 20 25.9	1 20 14.0	1 20 2.2	1 19 50.3	1 19 38.4	+0.89	-1.19
40	1 20 46.7	1 20 34.9	1 20 23.0	1 20 11.1	1 19 59.2	1 19 47.3	0.90	1.19
50	1 20 55.8	1 20 43.9	1 20 32.0	1 20 20.1	1 20 8.2	1 19 56.3	0.90	1.19
0	1 21 5.0	1 20 53.1	1 20 41.1	1 20 29.2	1 20 17.3	1 20 5.4	0.91	1.19
10	1 21 14.2	1 21 2.3	1 20 50.3	1 20 38.4	1 20 26.4	1 20 14.5	0.92	1.19
20	1 21 23.5	1 21 11.5	1 20 59.6	1 20 47.6	1 20 35.6	1 20 23.7	+0.93	-1.20
30	1 21 32.9	1 21 20.9	1 21 8.9	1 20 56.9	1 20 44.9	1 20 32.9	0.94	1.20
40	1 21 42.4	1 21 30.3	1 21 18.3	1 21 6.3	1 20 54.3	1 20 42.3	0.94	1.20
50	1 21 51.9	1 21 39.9	1 21 27.8	1 21 15.8	1 21 3.7	1 20 51.7	0.95	1.20
0	1 22 1.5	1 21 49.5	1 21 37.4	1 21 25.3	1 21 13.3	1 21 1.2	0.96	1.21
10	1 22 11.2	1 21 59.1	1 21 47.0	1 21 34.9	1 21 22.9	1 21 10.8	+0.97	-1.21
20	1 22 21.0	1 22 8.9	1 21 56.8	1 21 44.6	1 21 32.5	1 21 20.4	0.98	1.21
30	1 22 30.9	1 22 18.7	1 22 6.6	1 21 54.4	1 21 42.3	1 21 30.2	0.98	1.21
40	1 22 40.8	1 22 28.6	1 22 16.5	1 22 4.3	1 21 52.2	1 21 40.0	0.99	1.22
50	1 22 50.8	1 22 38.6	1 22 26.5	1 22 14.3	1 22 2.1	1 21 49.9	1.00	1.22
0	1 23 0.9	1 22 48.7	1 22 36.5	1 22 24.3	1 22 12.1	1 21 59.9	+1.01	-1.22
10	1 23 11.1	1 22 58.9	1 22 46.6	1 22 34.4	1 22 22.2	1 22 9.9	1.02	1.22
20	1 23 21.4	1 23 9.1	1 22 56.9	1 22 44.6	1 22 32.3	1 22 20.1	1.03	1.23
30	1 23 31.7	1 23 19.5	1 23 7.2	1 22 54.9	1 22 42.6	1 22 30.3	1.04	1.23
40	1 23 42.2	1 23 29.9	1 23 17.6	1 23 5.3	1 22 52.9	1 22 40.6	1.04	1.23
50	1 23 52.7	1 23 40.4	1 23 28.0	1 23 15.7	1 23 3.4	1 22 51.0	+1.05	-1.23
0	1 24 3.3	1 23 51.0	1 23 38.6	1 23 26.2	1 23 13.9	1 23 1.5	1.06	1.24
10	1 24 14.0	1 24 1.6	1 23 49.3	1 23 36.9	1 23 24.5	1 23 12.1	1.07	1.24
20	1 24 24.8	1 24 12.4	1 24 0.0	1 23 47.6	1 23 35.2	1 23 22.8	1.08	1.24
30	1 24 35.7	1 24 23.3	1 24 10.8	1 23 58.4	1 23 45.9	1 23 33.5	1.08	1.24
40	1 24 46.7	1 24 34.2	1 24 21.7	1 24 9.3	1 23 56.8	1 23 44.3	+1.09	-1.25
50	1 24 57.7	1 24 45.2	1 24 32.7	1 24 20.2	1 24 7.8	1 23 55.3	1.11	1.25
0	1 25 8.9	1 24 56.4	1 24 43.9	1 24 31.3	1 24 18.8	1 24 6.3	1.12	1.25
10	1 25 20.1	1 25 7.6	1 24 55.1	1 24 42.5	1 24 29.9	1 24 17.4	1.12	1.25
20	1 25 31.5	1 25 18.9	1 25 6.3	1 24 53.8	1 24 41.2	1 24 28.6	1.13	1.26
30	1 25 42.9	1 25 30.3	1 25 17.7	1 25 5.1	1 24 52.5	1 24 39.9	+1.14	-1.26
40	1 25 54.5	1 25 41.8	1 25 29.2	1 25 16.5	1 25 3.9	1 24 51.3	1.15	1.26
50	1 26 6.1	1 25 53.4	1 25 40.8	1 25 28.1	1 25 15.4	1 25 2.8	1.16	1.27
0	1 26 17.8	1 26 5.1	1 25 52.4	1 25 39.7	1 25 27.0	1 25 14.3	1.17	1.27
10	1 26 29.6	1 26 16.9	1 26 4.2	1 25 51.5	1 25 38.7	1 25 26.0	1.18	1.27
20	1 26 41.5	1 26 28.8	1 26 16.0	1 26 3.3	1 25 50.5	1 25 37.8	+1.19	-1.27
30	1 26 53.5	1 26 40.8	1 26 28.0	1 26 15.2	1 26 2.4	1 25 49.7	1.20	1.28
40	1 27 5.7	1 26 52.9	1 26 40.0	1 26 27.2	1 26 14.4	1 26 1.6	1.21	1.28
50	1 27 17.9	1 27 5.0	1 26 52.2	1 26 39.4	1 26 26.5	1 26 13.7	1.22	1.28
0	1 27 30.2	1 27 17.3	1 27 4.5	1 26 51.6	1 26 38.7	1 26 25.9	1.23	1.29
10	1 27 42.6	1 27 29.7	1 27 16.8	1 27 3.9	1 26 51.0	1 26 38.1	+1.24	-1.29
20	1 27 55.1	1 27 42.2	1 27 29.3	1 27 16.4	1 27 3.4	1 26 50.5	1.25	1.29
30	1 28 7.8	1 27 54.8	1 27 41.9	1 27 28.9	1 27 15.9	1 27 3.0	1.26	1.30
40	1 28 20.5	1 28 7.5	1 27 54.5	1 27 41.5	1 27 28.5	1 27 15.5	1.27	1.30
50	1 28 33.4	1 28 20.3	1 28 7.3	1 27 54.3	1 27 41.3	1 27 28.2	1.28	1.30
0	1 28 46.3	1 28 33.2	1 28 20.2	1 28 7.1	1 27 54.1	1 27 41.0	+1.29	-1.31

AZIMUTH OF POLARIS AT ELONGATION, 1918.

Decl. Lat.	88° 52' 0"	88° 52' 10"	88° 52' 20"	88° 52' 30"	88° 52' 40"	88° 52' 50"	Variation for—	
							1' of Lat.	1" of L.
• ' "	• ' "	• ' "	• ' "	• ' "	• ' "	• ' "	"	"
40 0	1 28 46.3	1 28 33.2	1 28 20.2	1 28 7.1	1 27 54.1	1 27 41.0	+1.29	-1.31
40 10	1 28 59.4	1 28 46.3	1 28 33.2	1 28 20.1	1 28 7.0	1 27 53.9	1.30	1.31
40 20	1 29 12.5	1 28 59.4	1 28 46.3	1 28 33.2	1 28 20.0	1 28 6.9	1.31	1.32
40 30	1 29 25.8	1 29 12.7	1 28 59.5	1 28 46.4	1 28 33.2	1 28 20.0	1.32	1.32
40 40	1 29 39.2	1 29 26.0	1 29 12.8	1 28 59.6	1 28 46.5	1 28 33.3	1.34	1.32
40 50	1 29 52.7	1 29 39.5	1 29 26.3	1 29 13.0	1 28 59.8	1 28 46.6	+1.35	-1.32
41 0	1 30 6.3	1 29 53.1	1 29 39.8	1 29 26.6	1 29 13.3	1 29 0.1	1.36	1.32
41 10	1 30 20.1	1 30 6.8	1 29 53.5	1 29 40.2	1 29 26.9	1 29 13.6	1.37	1.33
41 20	1 30 33.9	1 30 20.6	1 30 7.3	1 29 53.9	1 29 40.6	1 29 27.3	1.38	1.33
41 30	1 30 47.9	1 30 34.5	1 30 21.2	1 30 7.8	1 29 54.4	1 29 41.1	1.40	1.34
41 40	1 31 2.0	1 30 48.6	1 30 35.2	1 30 21.8	1 30 8.4	1 29 55.0	+1.41	-1.34
41 50	1 31 16.2	1 31 2.7	1 30 49.3	1 30 35.9	1 30 22.5	1 30 9.0	1.42	1.34
42 0	1 31 30.5	1 31 17.0	1 31 3.6	1 30 50.1	1 30 36.6	1 30 23.2	1.43	1.35
42 10	1 31 44.9	1 31 31.4	1 31 17.9	1 31 4.4	1 30 50.9	1 30 37.4	1.44	1.35
42 20	1 31 59.5	1 31 46.0	1 31 32.4	1 31 18.9	1 31 5.4	1 30 51.8	1.46	1.35
42 30	1 32 14.2	1 32 0.6	1 31 47.0	1 31 33.5	1 31 19.9	1 31 6.3	+1.47	-1.36
42 40	1 32 29.0	1 32 15.4	1 32 1.8	1 31 48.2	1 31 34.6	1 31 21.0	1.48	1.36
42 50	1 32 43.9	1 32 30.3	1 32 16.7	1 32 3.0	1 31 49.4	1 31 35.7	1.49	1.36
43 0	1 32 59.0	1 32 45.3	1 32 31.7	1 32 18.0	1 32 4.3	1 31 50.6	1.50	1.37
43 10	1 33 14.2	1 33 0.5	1 32 46.8	1 32 33.1	1 32 19.4	1 32 5.6	1.52	1.37
43 20	1 33 29.5	1 33 15.8	1 33 2.0	1 32 48.3	1 32 34.5	1 32 20.8	+1.53	-1.37
43 30	1 33 45.0	1 33 31.2	1 33 17.4	1 33 3.6	1 32 49.9	1 32 36.1	1.54	1.38
43 40	1 34 0.6	1 33 46.8	1 33 33.0	1 33 19.1	1 33 5.3	1 32 51.5	1.56	1.38
43 50	1 34 16.3	1 34 2.5	1 33 48.6	1 33 34.7	1 33 20.9	1 33 7.0	1.57	1.39
44 0	1 34 32.2	1 34 18.3	1 34 4.4	1 33 50.5	1 33 36.6	1 33 22.7	1.58	1.39
44 10	1 34 48.2	1 34 34.3	1 34 20.3	1 34 6.4	1 33 52.4	1 33 38.5	+1.60	-1.39
44 20	1 35 4.4	1 34 50.4	1 34 36.4	1 34 22.4	1 34 8.4	1 33 54.4	1.61	1.40
44 30	1 35 20.7	1 35 6.6	1 34 52.6	1 34 38.6	1 34 24.6	1 34 10.5	1.63	1.40
44 40	1 35 37.1	1 35 23.0	1 35 9.0	1 34 54.9	1 34 40.8	1 34 26.8	1.64	1.41
44 50	1 35 53.6	1 35 39.5	1 35 25.4	1 35 11.3	1 34 57.2	1 34 43.1	1.65	1.41
45 0	1 36 10.4	1 35 56.2	1 35 42.1	1 35 27.9	1 35 13.8	1 34 59.6	+1.67	-1.41
45 10	1 36 27.2	1 36 13.0	1 35 58.9	1 35 44.7	1 35 30.5	1 35 16.3	1.68	1.42
45 20	1 36 44.2	1 36 30.0	1 36 15.8	1 36 1.6	1 35 47.3	1 35 33.1	1.70	1.42
45 30	1 37 1.4	1 36 47.1	1 36 32.9	1 36 18.6	1 36 4.3	1 35 50.1	1.71	1.43
45 40	1 37 18.7	1 37 4.4	1 36 50.1	1 36 35.8	1 36 21.5	1 36 7.2	1.73	1.43
45 50	1 37 36.2	1 37 21.8	1 37 7.5	1 36 53.1	1 36 38.8	1 36 24.4	+1.74	-1.44
46 0	1 37 53.8	1 37 39.4	1 37 25.0	1 37 10.6	1 36 56.2	1 36 41.8	1.76	1.44
46 10	1 38 11.6	1 37 57.1	1 37 42.7	1 37 28.3	1 37 13.8	1 36 59.4	1.77	1.44
46 20	1 38 29.5	1 38 15.0	1 38 0.5	1 37 46.1	1 37 31.6	1 37 17.1	1.79	1.45
46 30	1 38 47.6	1 38 33.1	1 38 18.5	1 38 4.0	1 37 49.5	1 37 35.0	1.80	1.45
46 40	1 39 5.9	1 38 51.3	1 38 36.7	1 38 22.1	1 38 7.6	1 37 53.0	+1.82	-1.46
46 50	1 39 24.3	1 39 9.7	1 38 55.0	1 38 40.4	1 38 25.8	1 38 11.2	1.84	1.46
47 0	1 39 42.9	1 39 28.2	1 39 13.5	1 38 58.9	1 38 44.2	1 38 29.5	1.86	1.47
47 10	1 40 1.6	1 39 46.9	1 39 32.2	1 39 17.5	1 39 2.8	1 38 48.0	1.87	1.47
47 20	1 40 20.5	1 40 5.8	1 39 51.0	1 39 36.3	1 39 21.5	1 39 6.7	1.88	1.48
47 30	1 40 39.6	1 40 24.8	1 40 10.0	1 39 55.2	1 39 40.4	1 39 25.6	+1.90	-1.48
47 40	1 40 58.9	1 40 44.0	1 40 29.2	1 40 14.3	1 39 59.5	1 39 44.6	1.92	1.49
47 50	1 41 18.3	1 41 3.4	1 40 48.5	1 40 33.6	1 40 18.7	1 40 3.8	1.94	1.49
48 0	1 41 33.0	1 41 23.0	1 41 8.1	1 40 53.1	1 40 38.2	1 40 23.2	1.96	1.50
48 10	1 41 57.8	1 41 42.8	1 41 27.8	1 41 12.8	1 40 57.8	1 40 42.8	1.98	1.50
48 20	1 42 17.7	1 42 2.7	1 41 47.6	1 41 32.6	1 41 17.5	1 41 2.5	+1.99	-1.50
48 30	1 42 37.9	1 42 22.8	1 42 7.7	1 41 52.6	1 41 37.5	1 41 22.4	2.01	1.51
48 40	1 42 58.2	1 42 43.1	1 42 27.9	1 42 12.8	1 41 57.7	1 41 42.5	2.03	1.51
48 50	1 43 18.5	1 43 3.6	1 42 48.4	1 42 33.2	1 42 18.0	1 42 2.8	2.05	1.52
49 0	1 43 39.8	1 43 24.2	1 43 9.0	1 42 53.8	1 42 38.5	1 42 23.3	2.07	1.52
49 10	1 44 0.4	1 43 45.1	1 43 29.8	1 43 14.5	1 42 59.2	1 42 43.9	+2.09	-1.53
49 20	1 44 21.5	1 44 6.2	1 43 50.8	1 43 35.5	1 43 20.1	1 43 4.8	2.11	1.53
49 30	1 44 42.8	1 44 27.4	1 44 12.0	1 43 56.6	1 43 41.2	1 43 25.8	2.13	1.54
49 40	1 45 4.3	1 44 48.9	1 44 33.4	1 44 18.0	1 44 2.5	1 43 47.1	2.16	1.54
49 50	1 45 26.0	1 45 10.5	1 44 55.0	1 44 39.5	1 44 24.0	1 44 8.5	2.17	1.55
0	1 45 47.9	1 45 32.4	1 45 16.8	1 45 1.3	1 44 45.7	1 44 30.1	+2.19	-1.56

AZIMUTH OF POLARIS AT ELONGATION, 1918.

88° 52' 0"	88° 52' 10"	88° 52' 20"	88° 52' 30"	88° 52' 40"	88° 52' 50"	Variation for—	
						1' of Lat.	1" of δ .
1 45 47.9	1 45 32.4	1 45 16.8	1 45 1.3	1 44 45.7	1 44 30.1	+2.19	-1.56
1 46 10.1	1 45 54.4	1 45 38.8	1 45 23.2	1 45 7.6	1 44 52.0	2.21	1.56
1 46 32.4	1 46 16.7	1 46 1.1	1 45 45.4	1 45 29.7	1 45 14.0	2.23	1.57
1 46 54.9	1 46 39.2	1 46 23.5	1 46 7.7	1 45 52.0	1 45 36.3	2.25	1.57
1 47 17.7	1 47 1.9	1 46 46.1	1 46 30.3	1 46 14.5	1 45 58.8	2.27	1.58
1 47 40.6	1 47 24.8	1 47 9.0	1 46 53.1	1 46 37.3	1 46 21.5	+2.29	-1.58
1 48 3.8	1 47 47.9	1 47 32.0	1 47 16.1	1 47 0.2	1 46 44.4	2.32	1.59
1 48 27.2	1 48 11.3	1 47 55.3	1 47 39.4	1 47 23.4	1 47 7.5	2.34	1.59
1 48 50.9	1 48 34.9	1 48 18.9	1 48 2.9	1 47 46.8	1 47 30.8	2.36	1.60
1 49 14.7	1 48 58.7	1 48 42.6	1 48 26.5	1 48 10.5	1 47 54.4	2.38	1.61
1 49 38.8	1 49 22.7	1 49 6.6	1 48 50.4	1 48 34.3	1 48 18.2	+2.41	-1.61
1 50 3.2	1 49 47.0	1 49 30.8	1 49 14.6	1 48 58.4	1 48 42.2	2.43	1.62
1 50 27.7	1 50 11.5	1 49 55.2	1 49 39.0	1 49 22.7	1 49 6.5	2.45	1.62
1 50 52.5	1 50 36.2	1 50 19.9	1 50 3.6	1 49 47.3	1 49 31.0	2.48	1.63
1 51 17.6	1 51 1.2	1 50 44.8	1 50 28.5	1 50 12.1	1 49 55.7	2.50	1.64
1 51 42.9	1 51 26.4	1 51 10.0	1 50 53.6	1 50 37.1	1 50 20.7	+2.53	-1.64
1 52 8.4	1 51 51.9	1 51 35.4	1 51 18.9	1 51 2.4	1 50 45.9	2.55	1.65
1 52 34.2	1 52 17.7	1 52 1.1	1 51 44.5	1 51 28.0	1 51 11.4	2.58	1.66
1 53 0.3	1 52 43.6	1 52 27.0	1 52 10.4	1 51 53.8	1 51 37.2	2.60	1.66
1 53 26.6	1 53 9.9	1 52 53.2	1 52 36.5	1 52 19.8	1 52 3.2	2.63	1.67
1 53 53.2	1 53 36.4	1 53 19.7	1 53 2.9	1 52 46.1	1 52 29.4	+2.66	-1.68
1 54 20.0	1 54 3.2	1 53 46.4	1 53 29.6	1 53 12.7	1 52 55.9	2.68	1.68
1 54 47.1	1 54 30.2	1 54 13.4	1 53 56.5	1 53 39.6	1 53 22.7	2.71	1.69
1 55 14.5	1 54 57.6	1 54 40.6	1 54 23.7	1 54 6.7	1 53 49.8	2.73	1.69
1 55 42.2	1 55 25.1	1 55 8.1	1 54 51.1	1 54 34.1	1 54 17.1	2.76	1.70
1 56 10.1	1 55 53.0	1 55 35.9	1 55 18.8	1 55 1.8	1 54 44.7	+2.79	-1.71
1 56 38.3	1 56 21.2	1 56 4.0	1 55 46.9	1 55 29.7	1 55 12.6	2.82	1.71
1 57 6.9	1 56 49.6	1 56 32.4	1 56 15.2	1 55 58.0	1 55 40.7	2.85	1.72
1 57 35.7	1 57 18.4	1 57 1.1	1 56 43.8	1 56 26.5	1 56 9.2	2.88	1.73
1 58 4.8	1 57 47.4	1 57 30.1	1 57 12.7	1 56 55.3	1 56 38.0	2.91	1.74
1 58 34.2	1 58 16.8	1 57 59.3	1 57 41.9	1 57 24.4	1 57 7.0	+2.94	-1.74
1 59 3.9	1 58 46.4	1 58 28.9	1 58 11.4	1 57 53.9	1 57 36.3	2.97	1.75
1 59 34.0	1 59 16.4	1 58 58.8	1 58 41.2	1 58 23.6	1 58 6.0	3.00	1.76
2 0 4.3	1 59 46.6	1 59 29.0	1 59 11.4	1 58 53.7	1 58 36.0	3.03	1.77
2 0 35.0	2 0 17.2	1 59 59.5	1 59 41.8	1 59 24.0	1 59 6.3	3.06	1.77
2 1 6.0	2 0 48.1	2 0 30.3	2 0 12.5	1 59 54.7	1 59 36.9	+3.09	-1.78
2 1 37.3	2 1 19.4	2 1 1.5	2 0 43.6	2 0 25.7	2 0 7.8	3.13	1.79
2 2 8.9	2 1 51.0	2 1 33.0	2 1 15.0	2 0 57.0	2 0 39.1	3.16	1.80
2 2 40.9	2 2 22.9	2 2 4.8	2 1 46.8	2 1 28.7	2 1 10.7	3.20	1.80
2 3 13.2	2 2 55.1	2 2 37.0	2 2 18.9	2 2 0.7	2 1 42.6	3.23	1.81
2 3 45.9	2 3 27.7	2 3 9.5	2 2 51.3	2 2 33.1	2 2 14.9	+3.26	-1.82
2 4 19.0	2 4 0.7	2 3 42.4	2 3 24.1	2 3 5.8	2 2 47.5	3.30	1.83
2 4 52.4	2 4 34.0	2 4 15.6	2 3 57.2	2 3 38.9	2 3 20.5	3.34	1.84
2 5 26.1	2 5 7.7	2 4 49.2	2 4 30.8	2 4 12.3	2 3 53.9	3.37	1.84
2 6 0.2	2 5 41.7	2 5 23.2	2 5 4.6	2 4 46.1	2 4 27.6	3.41	1.85
2 6 34.7	2 6 16.1	2 5 57.5	2 5 38.9	2 5 20.3	2 5 1.6	+3.45	-1.86
2 7 9.6	2 6 50.9	2 6 32.2	2 6 13.5	2 5 54.8	2 5 36.1	3.48	1.87
2 7 44.9	2 7 26.1	2 7 7.3	2 6 48.5	2 6 29.7	2 6 11.0	3.52	1.88
2 8 20.6	2 8 1.7	2 7 42.8	2 7 23.9	2 7 5.1	2 6 46.2	3.56	1.89
2 8 56.6	2 8 37.7	2 8 18.7	2 7 59.7	2 7 40.8	2 7 21.8	3.60	1.90
2 9 33.1	2 9 14.0	2 8 55.0	2 8 35.9	2 8 16.9	2 7 57.8	+3.65	-1.91
2 10 10.0	2 9 50.8	2 9 31.7	2 9 12.6	2 8 53.4	2 8 34.2	3.69	1.92
2 10 47.3	2 10 28.1	2 10 8.8	2 9 49.6	2 9 30.3	2 9 11.1	3.73	1.92
2 11 25.0	2 11 5.7	2 10 46.4	2 10 27.0	2 10 7.7	2 9 48.4	3.77	1.93
2 12 3.2	2 11 43.8	2 11 24.3	2 11 4.9	2 10 45.5	2 10 26.0	3.81	1.94
2 12 41.8	2 12 22.3	2 12 2.7	2 11 43.2	2 11 23.7	2 11 4.2	+3.86	-1.95
2 13 20.8	2 13 1.2	2 12 41.6	2 12 22.0	2 12 2.4	2 11 42.7	3.90	1.96
2 14 0.3	2 13 40.6	2 13 20.9	2 13 1.2	2 12 41.5	2 12 21.7	3.95	1.97
2 14 40.3	2 14 20.5	2 14 0.6	2 13 40.8	2 13 21.0	2 13 1.2	4.00	1.98
2 15 20.7	2 15 0.8	2 14 40.9	2 14 21.0	2 14 1.1	2 13 41.1	4.04	1.98
2 16 1.6	2 15 41.6	2 15 21.6	2 15 1.6	2 14 41.6	2 14 21.5	+4.08	-2.00

AZIMUTH OF POLARIS AT ELONGATION, 1918.

Decl. Lat.	88° 52' 0"	88° 52' 10"	88° 52' 20"	88° 52' 30"	88° 52' 40"	88° 52' 50"	Variation for—	
							1' of Lat.	1" of L.
• ' "	• ' "	• ' "	• ' "	• ' "	• ' "	• ' "	"	"
60 0	2 16 1.6	2 15 41.6	2 15 21.6	2 15 1.6	2 14 41.6	2 14 21.5	+4.09	-2.00
60 10	2 16 43.0	2 16 22.9	2 16 2.8	2 15 42.6	2 15 22.5	2 15 2.4	4.14	2.01
60 20	2 17 24.9	2 17 4.6	2 16 44.4	2 16 24.2	2 16 4.0	2 15 43.8	4.19	2.02
60 30	2 18 7.2	2 17 46.9	2 17 26.6	2 17 6.3	2 16 46.0	2 16 25.6	4.24	2.03
60 40	2 18 50.1	2 18 29.7	2 18 9.3	2 17 48.8	2 17 28.4	2 17 8.0	4.29	2.04
60 50	2 19 33.5	2 19 13.0	2 18 52.5	2 18 31.9	2 18 11.4	2 17 50.9	+4.34	-2.05
61 0	2 20 17.5	2 19 56.8	2 19 36.2	2 19 15.5	2 18 54.9	2 18 34.3	4.39	2.06
61 10	2 21 1.9	2 20 41.2	2 20 20.4	2 19 59.7	2 19 38.9	2 19 18.2	4.45	2.07
61 20	2 21 46.9	2 21 26.1	2 21 5.2	2 20 44.4	2 20 23.5	2 20 2.6	4.50	2.09
61 30	2 22 32.5	2 22 11.5	2 21 50.6	2 21 29.6	2 21 8.6	2 20 47.6	4.56	2.10
61 40	2 23 18.6	2 22 57.5	2 22 36.5	2 22 15.4	2 21 54.3	2 21 33.2	+4.62	-2.11
61 50	2 24 5.3	2 23 44.1	2 23 23.0	2 23 1.8	2 22 40.6	2 22 19.4	4.67	2.12
62 0	2 24 52.6	2 24 31.3	2 24 10.0	2 23 48.7	2 23 27.4	2 23 6.1	4.73	2.13
62 10	2 25 40.5	2 25 19.1	2 24 57.6	2 24 36.2	2 24 14.8	2 23 53.3	4.79	2.14
62 20	2 26 29.0	2 26 7.4	2 25 45.9	2 25 24.3	2 25 2.8	2 24 41.2	4.85	2.16
62 30	2 27 18.1	2 26 56.4	2 26 34.8	2 26 13.1	2 25 51.4	2 25 29.7	+4.92	-2.17
62 40	2 28 7.8	2 27 46.0	2 27 24.3	2 27 2.5	2 26 40.7	2 26 18.9	4.98	2.18
62 50	2 28 58.2	2 28 36.3	2 28 14.4	2 27 52.5	2 27 30.5	2 27 8.6	5.04	2.19
63 0	2 29 49.2	2 29 27.2	2 29 5.1	2 28 43.1	2 28 21.1	2 27 59.0	5.10	2.20
63 10	2 30 40.9	2 30 18.8	2 29 56.6	2 29 34.4	2 29 12.2	2 28 50.1	5.17	2.22
63 20	2 31 33.3	2 31 11.0	2 30 48.7	2 30 26.4	2 30 4.1	2 29 41.8	+5.24	-2.23
63 30	2 32 26.3	2 32 3.9	2 31 41.5	2 31 19.0	2 30 56.6	2 30 34.2	5.31	2.24
63 40	2 33 20.1	2 32 57.5	2 32 35.0	2 32 12.4	2 31 49.8	2 31 27.3	5.38	2.26
63 50	2 34 14.5	2 33 51.8	2 33 29.2	2 33 6.5	2 32 43.8	2 32 21.1	5.45	2.27
64 0	2 35 9.7	2 34 46.9	2 34 24.1	2 34 1.2	2 33 38.4	2 33 15.6	5.52	2.28
64 10	2 36 5.7	2 35 42.7	2 35 19.7	2 34 56.8	2 34 33.8	2 34 10.8	+5.59	-2.30
64 20	2 37 2.4	2 36 39.3	2 36 16.1	2 35 53.0	2 35 29.9	2 35 6.8	5.67	2.31
64 30	2 37 59.8	2 37 36.6	2 37 13.3	2 36 50.1	2 36 26.8	2 36 8.6	5.75	2.32
64 40	2 38 58.1	2 38 34.7	2 38 11.3	2 37 47.9	2 37 24.5	2 37 1.1	5.83	2.34
64 50	2 39 57.1	2 39 33.6	2 39 10.1	2 38 46.5	2 38 23.0	2 37 59.4	5.91	2.35
65 0	2 40 57.0	2 40 33.3	2 40 9.6	2 39 45.9	2 39 22.3	2 38 58.6	+5.99	-2.37
65 10	2 41 57.7	2 41 33.9	2 41 10.0	2 40 46.2	2 40 22.4	2 39 58.5	6.08	2.38
65 20	2 42 59.3	2 42 35.3	2 42 11.3	2 41 47.3	2 41 23.3	2 40 59.3	6.16	2.40
65 30	2 44 1.7	2 43 37.6	2 43 13.4	2 42 49.3	2 42 25.1	2 42 1.0	6.25	2.41
65 40	2 45 5.0	2 44 40.7	2 44 16.4	2 43 52.1	2 43 27.8	2 43 3.5	6.34	2.43
65 50	2 46 9.2	2 45 44.8	2 45 20.3	2 44 55.9	2 44 31.4	2 44 7.0	+6.43	-2.44
66 0	2 47 14.4	2 46 49.8	2 46 25.1	2 46 0.5	2 45 35.9	2 45 11.3	6.52	2.46
66 10	2 48 20.5	2 47 55.7	2 47 30.9	2 47 6.1	2 46 41.3	2 46 16.6	6.62	2.48
66 20	2 49 27.5	2 49 2.6	2 48 37.6	2 48 12.7	2 47 47.7	2 47 22.8	6.71	2.49
66 30	2 50 35.5	2 50 10.4	2 49 45.3	2 49 20.2	2 48 55.1	2 48 30.0	6.81	2.51
66 40	2 51 44.6	2 51 19.3	2 50 54.0	2 50 28.7	2 50 3.5	2 49 38.2	+6.91	-2.53
66 50	2 52 54.6	2 52 29.2	2 52 3.7	2 51 38.3	2 51 12.8	2 50 47.4	7.02	2.54
67 0	2 54 5.7	2 53 40.1	2 53 14.5	2 52 48.9	2 52 23.3	2 51 57.6	7.12	2.56
67 10	2 55 17.9	2 54 52.1	2 54 26.3	2 54 0.5	2 53 34.7	2 53 8.9	7.23	2.58
67 20	2 56 31.2	2 56 5.2	2 55 39.3	2 55 13.3	2 54 47.3	2 54 21.3	7.34	2.60
67 30	2 57 45.6	2 57 19.4	2 56 53.3	2 56 27.1	2 56 1.0	2 55 34.8	+7.45	-2.62
67 40	2 59 1.2	2 58 34.8	2 58 8.5	2 57 42.1	2 57 15.8	2 56 49.4	7.57	2.64
67 50	3 0 17.9	2 59 51.3	2 59 24.8	2 58 58.3	2 58 31.7	2 58 5.2	7.68	2.65
68 0	3 1 35.8	3 1 9.0	3 0 42.3	3 0 15.6	2 59 48.9	2 59 22.1	7.80	2.67
68 10	3 2 54.9	3 2 28.0	3 2 1.1	3 1 34.2	3 1 7.2	3 0 40.3	7.93	2.69
68 20	3 4 15.3	3 3 48.2	3 3 21.1	3 2 54.0	3 2 26.8	3 1 59.7	+8.05	-2.71
68 30	3 5 37.0	3 5 9.7	3 4 42.3	3 4 15.0	3 3 47.7	3 3 20.4	8.18	2.73
68 40	3 7 0.0	3 6 32.4	3 6 4.9	3 5 37.4	3 5 9.9	3 4 42.3	8.32	2.75
68 50	3 8 24.3	3 7 56.6	3 7 28.8	3 7 1.1	3 6 33.4	3 6 5.6	8.45	2.77
69 0	3 9 50.0	3 9 22.1	3 8 54.1	3 8 26.2	3 7 58.2	3 7 30.3	8.59	2.79
69 10	3 11 17.1	3 10 49.0	3 10 20.8	3 9 52.6	3 9 24.5	3 8 56.3	+8.73	-2.82
69 20	3 12 45.7	3 12 17.3	3 11 48.9	3 11 20.5	3 10 52.2	3 10 23.8	8.87	2.84
69 30	3 14 15.7	3 13 47.1	3 13 18.5	3 12 49.9	3 12 21.3	3 11 52.7	9.02	2.86
69 40	3 15 47.2	3 15 18.4	3 14 49.6	3 14 20.8	3 13 51.9	3 13 23.1	9.17	2.88
69 50	3 17 20.3	3 16 51.3	3 16 22.2	3 15 53.2	3 15 24.1	3 14 55.1	9.33	2.90
70 0	3 18 55.0	3 18 25.7	3 17 56.4	3 17 27.2	3 16 57.9	3 16 28.8	+9.49	-2.93

OR REDUCING TO ELONGATION OBSERVATIONS MADE NEAR ELONGATION.

Asimuth at Elong. ime.	1° 0'	1° 10'	1° 20'	1° 30'	1° 40'	1° 50'	2° 0'	2° 10'	Asimuth at Elong. Time.*
m 0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	m 0
1	0.0	0.0	0.0	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
2	+ 0.1	+ 0.2	+ 0.2	0.2	0.2	0.3	0.3	0.3	2
3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	3
4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	4
5	+ 0.9	+ 1.0	+ 1.1	+ 1.3	+ 1.4	+ 1.6	+ 1.7	+ 1.9	5
6	1.2	1.4	1.6	1.8	2.1	2.3	2.5	2.7	6
7	1.7	2.0	2.2	2.5	2.8	3.1	3.4	3.7	7
8	2.2	2.6	2.9	3.3	3.7	4.0	4.4	4.8	8
9	2.8	3.2	3.7	4.2	4.6	5.1	5.6	6.0	9
10	+ 3.4	+ 4.0	+ 4.6	+ 5.1	+ 5.7	+ 6.3	+ 6.9	+ 7.4	10
11	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0	11
12	4.9	5.8	6.6	7.4	8.2	9.0	9.9	10.7	12
13	5.8	6.8	7.7	8.7	9.7	10.6	11.6	12.6	13
14	6.7	7.8	9.0	10.1	11.2	12.3	13.4	14.6	14
15	+ 7.7	+ 9.0	+10.3	+11.6	+12.8	+14.1	+15.4	+16.7	15
16	8.8	10.2	11.7	13.2	14.6	16.1	17.5	19.0	16
17	9.9	11.5	13.2	14.9	16.5	18.2	19.8	21.5	17
18	11.1	12.9	14.8	16.7	18.5	20.4	22.2	24.1	18
19	12.4	14.4	16.5	18.6	20.6	22.7	24.7	26.8	19
20	+13.7	+16.0	+18.3	+20.6	+22.8	+25.1	+27.4	+29.7	20
21	15.1	17.6	20.1	22.7	25.2	27.7	30.2	32.7	21
22	16.6	19.3	22.1	24.9	27.6	30.4	33.2	35.9	22
23	18.1	21.1	24.2	27.2	30.2	33.2	36.2	39.3	23
24	19.7	23.0	26.3	29.6	32.9	36.2	39.5	42.8	24
25	+21.4	+25.0	+28.5	+32.1	+35.7	+39.2	+42.8	+46.4	25

Asimuth at Elong. ime.	2° 10'	2° 20'	2° 30'	2° 40'	2° 50'	3° 0'	3° 10'	3° 20'	Asimuth at Elong. Time.*
m 0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	m 0
1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	2
3	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	3
4	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	4
5	+ 1.9	+ 2.0	+ 2.1	+ 2.3	+ 2.4	+ 2.6	+ 2.7	+ 2.9	5
6	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	6
7	3.7	3.9	4.2	4.5	4.8	5.0	5.3	5.6	7
8	4.8	5.1	5.5	5.9	6.2	6.6	7.0	7.3	8
9	6.0	6.5	7.0	7.4	7.9	8.3	8.8	9.3	9
10	+ 7.4	+ 8.0	+ 8.6	+ 9.2	+ 9.7	+10.3	+10.9	+11.4	10
11	9.0	9.7	10.4	11.1	11.8	12.4	13.1	13.8	11
12	10.7	11.5	12.3	13.2	14.0	14.8	15.6	16.5	12
13	12.6	13.5	14.5	15.4	16.4	17.4	18.4	19.3	13
14	14.6	15.7	16.8	17.9	19.0	20.2	21.3	22.4	14
15	+16.7	+18.0	+19.3	+20.6	+21.9	+23.1	+24.4	+25.7	15
16	19.0	20.5	21.9	23.4	24.9	26.3	27.8	29.3	16
17	21.5	23.1	24.8	26.4	28.1	29.7	31.4	33.0	17
18	24.1	25.9	27.8	29.6	31.5	33.3	35.2	37.0	18
19	26.8	28.9	30.9	33.0	35.1	37.1	39.2	41.3	19
20	+29.7	+32.0	+34.3	+36.6	+38.8	+41.1	+43.4	+45.7	20
21	32.7	35.3	37.8	40.3	42.8	45.3	47.9	50.4	21
22	35.9	38.7	41.5	44.2	47.0	49.8	52.5	55.3	22
23	39.3	42.3	45.3	48.3	51.4	54.4	57.4	60.4	23
24	42.8	46.0	49.3	52.6	55.9	59.2	62.5	65.8	24
25	+46.4	+49.9	+53.5	+57.1	+60.7	+64.2	+67.8	+71.4	25

* Sidereal time from elongation.

FOR FINDING THE TIMES OF UPPER AND LOWER CULMINATION OF POLARIS, 1918, FROM THE OBSERVED TIMES WHEN THE STAR IS ON THE SAME VERTICAL CIRCLE WITH THE STARS ζ URSÆ MAJORIS (MIZAR) *SUB POLO* AND δ CASSIOPEIÆ *SUB POLO*, RESPECTIVELY.

Except at high latitudes, the pole star at either upper or lower culmination furnishes a simple and convenient method for laying down a meridian line on the earth's surface at points in the northern hemisphere. When the local time is unknown and accurate astronomical instruments are not available, the time of culmination of Polaris may be found by observing the instant when Polaris is vertically above (has the same azimuth as) ζ Ursæ Majoris (Mizar) below the pole, or δ Cassiopeiæ below the pole. In the former case, for the year 1918, Polaris is approaching upper culmination and in the latter case it is approaching lower culmination. The mean time interval which elapses between either of the observed times above mentioned and upper or lower culmination, as the case may be, is given at ten-day intervals in the following table. This method can not be used at places south of 30° north latitude.

ζ URSÆ MAJORIS (MIZAR). (Upper culmination of Polaris.)							δ CASSIOPEIÆ. (Lower culmination of Polaris.)						
Lat.		40°	45°	50°	55°	60°	Lat.		35°	40°	45°	50°	55°
Date.							Date.						
Jan.	1	m s 10 2	m s 10 0	m s 9 58	m s 9 55	m s 9 51	Jan.	1	m s 11 10	m s 11 12	m s 11 14	m s 11 16	m s 11 19
	11	9 52	9 50	9 47	9 45	9 41		11	10 59	11 1	11 3	11 6	11 9
	21	9 40	9 39	9 37	9 34	9 31		21	10 49	10 50	10 52	10 55	10 58
Feb.	31	9 30	9 28	9 26	9 24	9 20	Feb.	31	10 38	10 40	10 42	10 44	10 47
	10	9 20	9 18	9 16	9 14	9 10		10	10 28	10 29	10 31	10 34	10 37
	20	9 11	9 9	9 7	9 5	9 1		20	10 18	10 20	10 22	10 24	10 27
Mar.	2	9 3	9 1	8 59	8 57	8 53	Mar.	2	10 10	10 12	10 14	10 16	10 19
June	30	9 46	9 44	9 42	9 39	9 36		12	10 4	10 6	10 8	10 10	10 13
July	10	9 57	9 56	9 53	9 50	9 47		22	10 0	10 1	10 3	10 5	10 8
	20	10 9	10 7	10 4	10 1	9 58	Apr.	1	9 57	9 59	10 0	10 3	10 5
	30	10 20	10 18	10 15	10 12	10 8		11	9 57	9 58	10 0	10 2	10 5
Aug.	9	10 30	10 28	10 26	10 23	10 19		21	9 58	10 0	10 2	10 4	10 7
	19	10 40	10 38	10 35	10 32	10 28	May	1	10 2	10 4	10 5	10 8	10 10
	29	10 49	10 47	10 44	10 41	10 37		11	10 7	10 9	10 11	10 13	10 16
						21		10 15	10 16	10 18	10 20	10 23	
Sept.	8	10 57	10 55	10 52	10 49	10 45	June	31	10 23	10 25	10 27	10 29	10 32
	18	11 3	11 1	10 59	10 56	10 51		10	10 33	10 35	10 36	10 39	10 42
	28	11 9	11 6	11 4	11 1	10 57		20	10 43	10 45	10 47	10 49	10 52
Oct.	8	11 12	11 10	11 8	11 4	11 0	July	30	10 54	10 56	10 58	11 1	11 4
	18	11 14	11 12	11 10	11 7	11 2		10	11 6	11 8	11 10	11 12	11 15
	28	11 15	11 13	11 10	11 7	11 3		20	11 17	11 19	11 21	11 24	11 27
Nov.	7	11 14	11 11	11 9	11 6	11 2	July	30	11 28	11 30	11 32	11 35	11 38
	17	11 10	11 8	11 6	11 3	10 59							
	27	11 6	11 4	11 1	10 58	10 54		Nov.	27	12 16	12 18	12 20	12 23	12 26
Dec.	7	10 59	10 57	10 55	10 52	10 48	Dec.	7	12 9	12 11	12 13	12 16	12 19
	17	10 51	10 49	10 47	10 44	10 40		17	12 1	12 3	12 5	12 8	12 11
	27	10 42	10 40	10 38	10 35	10 31		27	11 52	11 53	11 56	11 58	12 1
	31	10 38	10 36	10 34	10 31	10 27		31	11 47	11 49	11 52	11 54	11 57

ARENT PLACE, TIME OF UPPER CULMINATION, AND TIME INTERVAL BETWEEN UPPER CULMINATION AND ELONGATION EAST OR WEST, OF POLARIS, 1918.

The local mean time of culmination on any meridian for a given date is found by taking the following table the *Mean Time* of the nearest Greenwich culmination, and applying to a product of the *Var. per Day* by the integral number of intervening days, this product ; numerically additive for an earlier date and subtractive for a later date than that given in the table; and by applying also the product of the *Var. per Hour* by the longitude from Greenwich expressed in hours and fractions of an hour, this product being numerically additive for East longitudes and subtractive for West longitudes.

The time interval between upper and lower culmination is 12^h diminished by one-half the merical value of the *Var. per Day*.

The last column below applies to all meridians.

Date.	Upper Culmination, Meridian of Greenwich.					Latitude.	Mean Time Interval, Elongation minus Upper Culm.	
	Apparent Right Ascension.	Apparent Declination.	Mean Time.	Var. per Day.	Var. per Hour.			
	h m l 29	° ' " +88 51	h m s	m s	W. E.		W. E.	
a. 1	129	88.3	6 48 44	-3 56.9	-9.87 +	10	+5 58.2-	
11	119	89.3	6 9 14	3 57.0	9.87	12	5 58.1	
21	108	89.6	5 29 44	3 57.0	9.87	14	5 57.9	
31	97	89.3	4 50 15	3 57.0	9.87	16	5 57.7	
b. 10	87	88.3	4 10 45	3 56.9	9.87	18	5 57.6	
20	78	86.7	3 31 17	-3 56.8	-9.87 +	20	+5 57.4-	
c. 2	70	84.6	2 51 50	3 56.6	9.86	22	5 57.2	
12	64	82.1	2 2 25	3 56.5	9.85	24	5 57.0	
22	59	79.2	1 33 1	3 56.3	9.84	26	5 56.8	
d. 1	57	76.2	0 53 40	3 56.1	9.84	28	5 56.6	
11	56	73.0	0 14 20	-3 55.8	-9.83 +	30	+5 56.4-	
20	58	70.0	23 35 3	3 55.6	9.82	32	5 56.2	
30	61	67.0	22 55 47	3 55.5	9.81	34	5 56.0	
e. 10	67	64.3	22 16 33	3 55.3	9.80	36	5 55.7	
20	74	61.9	21 37 21	3 55.1	9.80	38	5 55.5	
30	83	60.0	20 58 11	-3 55.0	-9.79 +	40	+5 55.2-	
f. 9	92	58.6	20 19 1	3 54.9	9.79	42	5 55.0	
19	103	57.6	19 39 53	3 54.8	9.78	44	5 54.7	
29	114	57.2	19 0 45	3 54.8	9.78	46	5 54.4	
g. 9	125	57.4	18 21 37	3 54.8	9.78	48	5 54.0	
19	137	58.1	17 42 29	-3 54.8	-9.78 +	50	+5 53.7-	
29	148	59.3	17 3 21	3 54.8	9.78	52	5 53.3	
h. 8	159	61.0	16 24 13	3 54.9	9.79	54	5 52.8	
18	169	63.1	15 45 4	3 54.9	9.79	56	5 52.3	
28	178	65.7	15 5 54	3 55.0	9.79	58	5 51.8	
i. 7	186	68.7	14 26 43	-3 55.2	-9.80 +	60	+5 51.2-	
17	193	71.9	13 47 31	3 55.3	9.80	62	5 50.6	
27	199	75.4	13 8 17	3 55.4	9.81	64	5 49.8	
j. 7	203	79.1	12 29 2	3 55.6	9.82	66	5 48.9	
17	205	82.8	11 49 46	3 55.8	9.82	68	5 47.9	
27	206	86.6	11 10 27	-3 55.9	-9.83 +	70	+5 46.7-	
k. 6	205	90.3	10 31 7	3 56.1	9.84			
16	202	93.8	9 51 45	3 56.3	9.85			
26	197	97.1	9 12 21	3 56.4	9.85			
l. 6	191	100.0	8 32 56	3 56.6	9.86			
16	183	102.5	7 53 29	-3 56.7	-9.86 +			
26	174	104.4	7 14 1	-3 56.9	-9.87 +			

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

There are in general use three different kinds of time, True Solar Time—so called Apparent Solar Time—Mean Solar Time, and Sidereal Time.

True or Apparent Solar Time is measured by the diurnal motion of the sun, the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being the hour-angle of the Sun westward from the meridian. Owing to the obliquity of the ecliptic and to the lack of uniformity of the motion of the Earth in its orbit, the rate of motion of the Sun in hour-angle and the length of the apparent solar day are not constant. Therefore clocks and chronometers can not be regulated to apparent solar time, which may, however, be determined by observations of the Sun when visible.

Mean Solar Time is measured by the motion of a fictitious body called the mean Sun, which is supposed to move uniformly in the celestial equator, completing the circuit in one tropical year. Since mean solar time is uniform and regular in its passage, clocks and watches may be regulated to it, and those in ordinary use are usually so regulated.

Mean solar time can not, of course, be determined by direct observation, but it may be determined indirectly by correcting observations of the Sun for the equation of time, or by converting to mean time sidereal time determined by observations of fixed stars.

The Equation of Time is the difference in hour-angle between the true Sun and the mean Sun. The true Sun is sometimes before and sometimes behind the mean Sun by an amount which varies from zero to about 16 minutes. The equation of time is given for Greenwich mean noon on pages 2-16 and for Washington apparent noon on pages 514-521.

The Mean Solar Day is the unit of mean solar time and is equal in length to the mean or average of all the true or apparent solar days of the year. It may be otherwise defined as the interval of time elapsing between two successive transits of the mean Sun across the meridian of any place.

Sidereal Time or star time, in general terms, is measured by the diurnal motion of the fixed stars, or, speaking more precisely, by the diurnal motion of that point on the celestial equator called the vernal equinox, from which the right ascensions of the heavenly bodies are measured. Astronomical clocks regulated to sidereal time are called sidereal clocks. Sidereal time may be determined from observations of stars whose right ascensions are known.

A Sidereal Day is very nearly the length of time in which the Earth rotates on its axis and is accurately defined as the time interval between two suc-

cessive transits of the vernal equinox over the same meridian. The sidereal day is shorter than the mean solar day by $3^m 56^s.555$ sidereal time or $3^m 55^s.909$ mean solar time, the tropical year of 365.2422 mean solar days containing 366.2422 sidereal days. Sidereal time and the length of the sidereal day are subject to slight irregularities on account of small differences between the positions of the true and mean equinoxes.

The mean solar and sidereal days are each divided into 24 hours. About March 23 (civil date) of each year, about two days after the vernal equinox, there is an instant when the face of a sidereal clock shows the same time as a mean time clock, and the former gains on the latter $3^m 56^s.555$ sidereal time per mean solar day, so that at the end of a year it will have gained one sidereal day and will again agree with the mean time clock.

The Civil Day begins at midnight and comprises 24 hours, the hours being counted from 0 to 12 in two series; the first, marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

The Astronomical Day begins at noon on the civil day of the same date, the 24 hours being counted from 0 to 24, running from noon of one day to noon of the next following day. Astronomical time as well as civil time may be either apparent or mean.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day coincides with the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Hence we have the following rules:

To convert Civil Time into Astronomical Time.—If the civil time is marked A. M., take one from the day and add twelve to the hours; if the civil time is marked P. M., take away the designation P. M. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14^h , astronomical time; and January 9, 2 o'clock, P. M., civil time, is January 9, 2^h , astronomical time.

To convert Astronomical Time into Civil Time.—If the astronomical time is less than twelve hours, write P. M. after it; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To convert Solar or Sidereal Time of any meridian B to that of another meridian A, add the difference of longitude expressed in time when A is east of B, and subtract the difference of longitude when A is west of B.

Greenwich mean time, which at any fixed observatory is obtained by applying the longitude to the local mean time, on board ship is usually taken from the mean time chronometer set to Greenwich time.

Greenwich mean noon of any date means the noon at the beginning of the astronomical day.

PART I.—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2-17 contain for Greenwich mean noon of each day the *Sun's Apparent Right Ascension, Apparent Declination, Semidiameter, Horizontal Parallax, True Longitude, and Latitude*. They also contain the *Logarithm of the Radius Vector of the Earth, the Precession in Longitude, the Nutation in Longitude, the Aberration, the True Obliquity, the Equation of Time, the Sidereal Time or Right Ascension of Mean Sun, and the Mean Time of Sidereal Noon*. Adjoining columns contain, for each Greenwich mean noon, the *Variation per*

Hour for those of the quantities for which it seemed advisable to give a rate of motion. By multiplying any one of those variations by the hours and parts of an hour from Greenwich mean noon and adding the product algebraically to the corresponding quantity at noon, we obtain an approximate value of the quantity in question for any given Greenwich mean time. If great exactness is desired, the value of the hourly variation is found for the time halfway between Greenwich mean noon and the given Greenwich mean time before multiplying by the hours and parts of an hour from Greenwich mean noon.

It is to be noted that here, as elsewhere throughout the volume, the positive sign used with declinations or latitudes indicates north and the negative sign south.

The Sun's *Apparent Right Ascension* and *Declination* are affected both by aberration and by nutation, and therefore denote the *apparent* position of the *true* Sun. The Sun's *True Longitude* is the true geometric longitude not corrected for aberration; it is referred to the true equinox.

The Sun's *Latitude* is referred to the ecliptic of the date.

The Sun's *Declination* is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth.

The Sun's *Semidiameter* is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object to the distance from the center of the Sun.

The *Horizontal Parallax* is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

The *Precession in Longitude* is the quantity to be applied to the longitude of the Sun referred to the mean equinox of the beginning of the Besselian fictitious year, i. e., the instant when the Sun's mean longitude is 280° , in order to refer it to the mean equinox of date.

The *Nutation in Longitude* is the quantity to be applied to the longitude of a body referred to the mean equinox of date in order to refer it to the true equinox, short-period terms being neglected.

The *Aberration* is the quantity to be subtracted from the true longitude of the Sun in order to obtain its apparent longitude.

The *True Obliquity* is the inclination of the Earth's equator to the ecliptic, short-period terms being neglected.

The corrections to the values of the nutation and the obliquity here given, to take account of the short-period terms, may be found on pages 215-216.

The *Equation of Time* is the apparent time of Greenwich mean noon, or the hour angle of the true Sun at that instant. When interpolated to any given Greenwich mean time, it is the correction to be applied to mean time in order to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun at Greenwich mean noon. It may be reduced for the longitude or to any Greenwich mean time by using the hourly variation, $+9^s.8565$; or by Table III, page 695 of this volume, for reducing intervals of mean time to sidereal time. It is useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the right ascension of the mean Sun for that time,

and this being added to the local astronomical mean time, i. e., the hour angle of the mean Sun, will give the hour angle of the vernal equinox, or the sidereal time required.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time gives the interval of sidereal time past noon, and that is converted into the required mean time by subtracting from it the corresponding reduction of a sidereal interval to a mean-time interval, taken from Table II, page 692 of this volume. If the sidereal interval is less than $3^m\ 56^s.555$, there are two mean times corresponding to the given sidereal time, one a few minutes after the preceding noon, and the other a few minutes before the following noon, the mean time interval between these two mean times being $23^h\ 56^m\ 4^s.09$. The mean time, approximately known, will always show which one is to be taken. Instead of using Table II the reduction of a sidereal to a mean time interval may be found by multiplying $-9^s.8296$ by the hours and parts of an hour of the sidereal interval.

The *Mean Time of Sidereal Noon* is the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich; it may be reduced to any other meridian by using the hourly variation, $-9^s.8296$, to effect the necessary interpolation, or the reduction may be taken directly from Table II. In the same way the reduction may be made to any Greenwich sidereal time, and the result will then represent $24^h -$ Right Ascension of the Mean Sun. This column may be conveniently used for converting sidereal to mean time, or—which is the same problem—for finding the time of meridian passage of a star whose right ascension is known, by adding to the mean time of the *preceding* local sidereal noon, the mean time equivalent of the given sidereal time.

As examples of the use of pages 2-17:

1. Let the Sun's declination be required for 1918, April 14, $2^h\ 5^m\ 20^s$, P. M., at a place whose longitude is $58^\circ\ 20'$, or $3^h\ 53^m\ 20^s$ west from Greenwich:

Local mean time	April 14,	$\begin{smallmatrix} h & m & s \\ 2 & 5 & 20 \end{smallmatrix}$
Longitude from Greenwich (additive) . . . . .	. . . . .	$\begin{smallmatrix} 3 & 53 & 20 \end{smallmatrix}$
Greenwich mean time	April 14,	$\begin{smallmatrix} 5 & 58 & 40 \end{smallmatrix}$

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $5^h.978$ after Greenwich mean noon on April 14, or $18^h.022$ before Greenwich mean noon on April 15.

On page 6 of the Ephemeris we find that the variation of declination per hour is:

At Greenwich mean noon, April 14	$+54.21$
At Greenwich mean noon, April 15	$+53.82$
Difference for one day	-0.39

If great exactness is desired, we find the amount of this hourly variation for the time halfway between Greenwich noon and the time of observation; that is, for 3 hours after Greenwich noon of the 14th, this being half of 6 hours. *Three hours* is 0.125 of a day; so the calculation is as follows:

Variation at Greenwich mean noon, April 14	.	.	.	.	.	+	54.21
Change in 0.125 of a day	.	.	.	.	.	-	0.05
Variation at 3 hours after noon	.	.	.	.	.	+	54.16
Declination at Greenwich noon, April 14	.	.	.	.	.	+	9 12 47.4
Change in 5.978 hours	.	.	.	.	.	+	5 23.8
Sun's declination at time of observation	.	.	.	.	.	+	9 18 11.2

With equal facility the computation might have been made backward from the succeeding noon. Thus in the example just given the time is 18^h.022 before Greenwich noon of April 15; half this interval is about 0.375 of a day, and the hourly motion for the middle of the interval is +53''.97. Then we find:

Declination at Greenwich noon, April 15	.	.	.	.	.	+	9 34 23.9
Change in -18.022 hours,	.	.	.	.	.	-	16 12.7
Sun's declination at time of observation	.	.	.	.	.	+	9 18 11.2

It will always be well to make the calculation in both ways, as a check; if the results differ slightly the one derived from the nearest noon should be regarded as the more accurate.

2. Let the Sun's right ascension and the equation of time be required for 18, July 13, 10^h 3^m 30^s, A. M., mean time, at a place whose longitude is 85° 15', or 5^h 41^m west from Greenwich.

Local astronomical mean time	.	.	.	.	July 12,	22 3 30
Longitude from Greenwich (additive)	.	.	.	.	.	5 41 0
Greenwich mean time	.	.	.	.	July 13,	3 44 30-3.7417

Sun's Right Ascension.

Equation of Time.

Greenwich noon, July 13	.	.	.	.	.	7 27 41.34	.	.	.	.	.	-	5 27.73
Change in 3.7417 hours	.	.	.	.	.	10°.167×3.7417	.	.	.	.	.	-	1.16
						7 28 19.38						-	5 28.89

In this case the hourly variations interpolated to half the interval, or .87 after noon, have been used.

3. If the sidereal time is required for the same time and place, we have:

Sidereal time at Greenwich mean noon, July 13	.	.	.	.	.	7 22 13.61
Reduction for 3 ^h 44 ^m 30 ^s from Table III, or 9°.8565×3.7417	.	.	.	.	.	+ 36.88
Add the local astronomical mean time	.	.	.	.	.	22 3 30.00
The required sidereal time (rejecting 24 ^h)	.	.	.	.	.	5 26 20.49

4. On 1918, July 13, A. M., at a place whose longitude is 85° 15' W., suppose the sidereal time to be 5^h 26^m 20^s.49 and that the corresponding mean time is required.

The astronomical day is July 12; the longitude in time, $+5^h 41^m 0^s$, or $+5^h.6833$.

First solution.

Sidereal time at Greenwich mean noon, July 12	$h \quad m \quad s$ 7 18 17.06
Reduction for $5^h 41^m 0^s$ from Table III, or $9^s.8565 \times 5.6833$	+56.02
The sidereal time at local mean noon, July 12	7 19 13.08
The given sidereal time ($+24^h$, if necessary for the following subtraction)	29 26 20.49
Subtracting the first from the second gives the sidereal interval from noon	22 7 7.41— $22^h.1187$
Reduction for $22^h 7^m 7^s.41$ from Table II, or $-9^s.8296 \times 22.1187$	-3 37.42
The required astronomical mean time July 12,	22 3 29.99

Second solution.

Mean time at Greenwich sidereal noon July 12,	$h \quad m \quad s$ 16 38 58.84
Reduction for longitude from Table II, or $-9^s.8296 \times 5.6833$	-55.86
Mean time of <i>preceding</i> local sidereal noon July 12,	16 38 2.98
Add the given sidereal time	5 26 20.49
Reduction for $5^h 26^m 20^s.49$ from Table II, or $-9^s.8296 \times 5.4390$	-53.46
The required astronomical mean time July 12,	22 3 30.01

If there is any doubt about the mean time of the *preceding* local sidereal noon, the first solution is to be preferred.

Pages 18–25 contain the rectangular coordinates of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox as the plane and point of reference. Each coordinate is given for every Greenwich mean noon and midnight. The columns *Reduc. to Mean Eq'x of 1918.0* give the corrections to be applied to the coordinates for noon in order to obtain the corresponding coordinates referred to the mean equator and equinox of the beginning of the Besselian fictitious year.

Pages 26–117 contain *The Moon's Right Ascension and Declination* for each day and hour of Greenwich mean time, referred to the true equator and equinox. They are accompanied by columns of *Variations per Minute*, by means of which, interpolation may be conveniently made to any moment of Greenwich mean time. The right ascension or declination is taken out for the given day and hour of Greenwich mean time; the *Var. per Min.* is multiplied by the minutes and parts of a minute of the Greenwich time, and the product is added numerically in case of the right ascension and algebraically in case of the declination.

Thus, suppose the Moon's right ascension and declination are required for 1918, January 25, $10^h 10^m 30^s$, astronomical mean time at Greenwich:

	<i>Right Ascension.</i>	<i>Declination.</i>
	$h \quad m \quad s$	$^{\circ} \quad ' \quad ''$
January 25, 10^h	7 31 8.18	+19 59 21.0
Change in 10.5 minutes $2^s.1492 \times 10.5$	22.57	- 1 17.9
January 25, $10^h 10^m 30^s$	7 31 30.75	+19 58 3.1

For the sake of precision the differences here employed have been interpolated for $5^m.2=0^h.09$.

Page 117 contains also the Phases of the Moon and the dates of the *Moon's Apogee and Perigee*, or greatest and least distances from the Earth.

Pages 118–133 contain for every Greenwich mean noon and midnight the *Moon's Longitude* and *Latitude* referred to the true equinox and the ecliptic, its *Semidiameter*, and its *Equatorial Horizontal Parallax*. The column adjoining that of the horizontal parallax gives the variation of that quantity per hour, by means of which it can be reduced to any other Greenwich mean time in the manner shown in the preceding examples. When allowing for change in the variation itself, note must be taken of the fact that the tabular interval is here 12 hours instead of 24. The quantity thus obtained is the equatorial horizontal parallax; to obtain the horizontal parallax at any given place, the correction for the latitude of the place must be applied. The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.2725 (see page xi), or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for 1918, March 10, 7^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of March 10 is 5''.6; then,

$$12^h : 7^h = 5''.6 : 3''.3$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing. The Moon's semidiameter for March 10, 7^h, is therefore 16' 33''.7.

The Moon's semidiameter and horizontal parallax are required for all observations of the Moon.

Pages 118–133 contain also: The *Moon's Age*, or the time elapsed since the preceding new Moon, given to tenths of a day; the mean time of the *Moon's Transit*, *Upper* and *Lower*, at Greenwich, given to tenths of a minute; and the *Variation per Hour* of the latter quantity, that is, the variation for one hour of longitude, by means of which the local time of an upper or lower transit of the Moon may be computed for any place whose longitude is known.

Pages 134–198 contain for each of the seven major planets the geocentric ephemeris followed immediately by the heliocentric ephemeris.

The geocentric ephemeris gives the planet's *Apparent Right Ascension* and *Apparent Declination* with the respective *Variations per Hour* or *per Day*. The positions thus given are referred to the true equator and equinox, and are corrected for aberration. The geocentric ephemeris gives also the *Logarithm of Distance from Earth* with the *Variation per Hour* or *per Day*, the planet's *Semidiameter* and *Horizontal Parallax*, and, to tenths of a minute, the time of *Transit Meridian of Greenwich*. All the data, except the last named, are given for Greenwich mean noon.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth. The mode of reducing the ephemeris positions of planets to other instants of Greenwich mean time is the same as that already given for the Sun. The local mean time of meridian transit of any planet at any place can be found by dividing the proper daily difference of the ephemeris times by 24, multiplying the quotient by the longitude of the place expressed in hours and fractions, and applying the product with its proper sign to the time of Greenwich transit.

The heliocentric ephemeris gives the *Heliocentric Longitude*, *Mean Equinox of Date*; the *Heliocentric Latitude*; and the *Logarithm of Radius Vector*; with

their respective *Variations per Day*. The heliocentric longitude may be referred to the true equinox by applying nutation. The variations are given for the instant of Greenwich mean noon. The column *Reduction to Orbit* contains the correction to be applied to the heliocentric longitude in order to obtain the longitude measured along the orbit of the planet. This orbit longitude is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The heliocentric latitude is referred to the ecliptic of the date. The *Logarithm of Radius Vector* is the logarithm of the distance of the center of the planet from that of the Sun.

PART II.—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Pages 200–201 contain formulæ for reducing mean positions of stars to apparent positions, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of the Paris Conference of May, 1896, and expressed in the notation of BESSEL.

Pages 202–205 contain the logarithms of the *Besselian Star-Numbers*, *A*, *B*, *C*, *D*, for each Washington mean midnight, with the values of *E* appended at the bottoms of the pages. The terms of short period have been included. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at any of the dates for which the numbers are given, and in ordinary cases four-figure logarithms suffice; but where extreme accuracy is desired the logarithms of *A*, *C*, and *D* are sometimes needed to five places of decimals. Along with the solar day, the first column contains the sidereal hour of Washington mean midnight for certain dates, and by interpolation among them it is easy to find the sidereal time for which any set of quantities is given.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:

Computation of the apparent place of α Aquilæ, May 26, 1918, for the upper transit at Washington.

$\log a$	0.5165	$\log b$	7.2455 <i>n</i>	$\log c$	8.0449	$\log d$	8.8235 <i>n</i>
$\log A$	9.8584	$\log B$	0.1516	$\log C$	0.8964 <i>n</i>	$\log D$	1.2691 <i>n</i>
$\log a'$	0.5174	$\log b'$	9.9941	$\log c'$	9.4341	$\log d'$	8.4160 <i>n</i>
$\log Aa$	0.3749	$\log Bb$	7.3971 <i>n</i>	$\log Cc$	8.9413 <i>n</i>	$\log Dd$	0.0926
$\log Aa'$	0.3758	$\log Bb'$	0.1457	$\log Cc'$	0.3305 <i>n</i>	$\log Dd'$	9.6851
Mean Place, 1918.0				α_0	^h 18 ^m 37 ^s 47.104	δ_0	[°] -9 ['] 7 ["] 55.37
				<i>Aa</i>	+2.371	<i>Aa'</i>	+2.33
				<i>Bb</i>	-0.002	<i>Bb'</i>	+1.40
				<i>Cc</i>	-0.087	<i>Cc'</i>	-2.14
				<i>Dd</i>	+1.238	<i>Dd'</i>	+0.48
				<i>E</i>	+0.003	$\tau\mu'$	0.00
				$\tau\mu$	+0.001		
Apparent Place, May 26,				α	^h 18 ^m 37 ^s 50.628	δ	[°] -9 ['] 7 ["] 53.25

Pages 206–213 contain the *Independent Star-Numbers*, which can frequently be advantageously used instead of the *Besselian Star-Numbers*. The terms of short period have been included. These quantities are connected with those of Bessel by the relations given on page 200, which also contains the formulæ

and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, $a, b, c, d, a', b', c', d'$, while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four-figure logarithms usually suffice, but where extreme accuracy is desired the logarithms of g and h are needed to five places of decimals, and G and H are needed to one-tenth of a minute of arc. The column τ gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:

Computation of the apparent place of ϵ Aquilæ, May 26, 1918, for the upper transit at Washington.

$G = \begin{matrix} h & m \\ 0 & 22.4 \end{matrix}$		$\delta_0 = \begin{matrix} ^\circ & ' \\ -9 & 7.9 \end{matrix}$	
$\alpha_0 = 18 \ 37.8$		$G + \alpha_0 = 19^h \ 0^m.2$	
$H = 13 \ 31.9$		$H + \alpha_0 = 8 \ 9.7$	
$\log \frac{1}{\tau}$	8.8239	$\log \frac{1}{\tau}$	8.8239
$\log g$	1.1624	$\log h$	1.3050
$\log \sin (G + \alpha_0)$	9.9848 <i>n</i>	$\log \sin (H + \alpha_0)$	9.9264
$\log \tan \delta_0$	9.2061 <i>n</i>	$\log \sec \delta_0$	0.0055
$\log (g)$	9.1772	$\log (h)$	0.0608
		$\alpha_0 = \begin{matrix} h & m & s \\ 18 & 37 & 47.104 \end{matrix}$	
		$f + f' =$	+2.221
		$(g) =$	+0.150
		$(h) =$	+1.150
		$\tau\mu =$	+0.001
		$\alpha = 18 \ 37 \ 50.626$	
$\log g$	1.1624	$\log h$	1.3050
$\log \cos (G + \alpha_0)$	9.4144	$\log \cos (H + \alpha_0)$	9.7293 <i>n</i>
$\log (g')$	0.5768	$\log \sin \delta_0$	9.2006 <i>n</i>
		$\log (h')$	0.2349
$\log i$	0.5337 <i>n</i>	$(i) =$	-3.37
$\log \cos \delta_0$	9.9945	$\tau\mu' =$	0.00
$\log (i)$	0.5282 <i>n</i>	$\delta = \begin{matrix} ^\circ & ' & '' \\ -9 & 7 & 53.25 \end{matrix}$	

Page 214 contains for every tenth sidereal day the *Besselian and Independent Star-Numbers*, exclusive of all short-period terms. They are useful in computing ephemerides of stars, similar to those on pages 316–513, for which data containing short-period terms should not be employed.

Pages 215–216 contain for Washington mean midnight of each day the short-period terms of the nutation in longitude and obliquity, for use in connection with the formulæ on page 201, and the coefficients mentioned later, which are given for each star on pages 316–513.

Pages 217–230 contain the *Mean Places of Ten-day Stars* for the beginning of the Besselian fictitious year. These pages give also the magnitude, spectral type, annual variations, and proper motions for each star. The annual variations are to be considered as the differential coefficients of each coordinate with respect to the time at the beginning of the year.

Page 231 contains, for the *Circumpolar Stars*, the same data as the immediately preceding pages do for the ten-day stars.

Pages 232–315 contain for every upper transit at Washington the apparent positions of seventeen northern and eighteen southern circumpolar stars arranged in the order of their right ascensions. The mean solar time of transit is given in the column *Washington Mean Time*, in order that each transit above

and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 232 we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But the lower transit of July 1 precedes the upper one, which occurs July 1.8. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column *Washington Mean Time*.

The secant and tangent of the apparent declination for the 15th of each month and the mean place in right ascension and declination for the beginning of the year are given for each star at the foot of the page.

Pages 316–513 contain, for every tenth upper transit at Washington, the apparent places of 790 stars, being all those given in the list of mean places of ten-day stars. The *Washington Mean Time* in the left-hand column of each page gives the day and tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each coordinate are given for every ten days.

In connection with the ephemeris of each ten-day star there are given at the foot of the page, (1) the seconds of the mean place in both right ascension and declination for the beginning of the year, (2) the secant and the tangent of the mean of the star's greatest and least apparent declinations during the year, and (3) the coefficients of the short-period terms of the nutation, the use of which is explained on page 201.

Pages 514–521 contain, for Washington apparent noon, the *Apparent Right Ascension and Declination* of the Sun, the *Equation of Time*, and the *Variation per Hour* of these quantities; the *Semidiameter* of the Sun, and the *Sidereal Time of Semidiameter Passing Meridian*. The last column on each page contains the *Sidereal Time of Mean Noon*.

The *Equation of Time*, *Mean–App.* is the correction to be applied to apparent time in order to obtain mean time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington counted from the nearest noon.

Pages 522–537 contain the *Right Ascension of Center*, the *Geocentric Declination of Center*, the *Sidereal Time of Semidiameter Passing Meridian*, the *Geocentric Semidiameter*, and the *Equatorial Horizontal Parallax* of the Moon, and the *Washington Mean Time* at the moment of each upper and lower transit over the meridian of Washington.

The *Variation per Hour of Longitude* is the correction to be applied in each case to the quantity in the preceding column to obtain its value for the time of transit over the meridian one hour west of Washington, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The quantities in the third column, when corrected for another longitude by the hourly variations, give the local mean time of transit for that longitude. By means of the variations per hour of longitude any one of the quantities under consideration can be computed with great *exactness* for the moment of transit over any meridian not more than one hour

stant from Washington. To obtain the same accuracy for more distant meridians, we may proceed as follows: Let F represent either the *Washington Mean Time*, the *Right Ascension of Center*, or the *Geocentric Declination of center*, and let V represent the corresponding *Variation per Hour of Longitude*. Write down three successive values of F , together with the corresponding values of V , and difference the latter as in the following scheme, where the middle values, F_0 and V_0 , belong to the culmination from which is to be derived the value of F for the culmination on the meridian whose longitude is λ :—

Function.	Var. per Hour of Longitude.	Δ'	Δ''
F_{-1}	V_{-1}	α'	b
F_0	V_0	α''	
F_{+1}	V_{+1}		

Then, for the culmination at the meridian λ

$$F_{\lambda} = F_0 + \lambda V_0 + \frac{\lambda^2}{48}(\alpha' + \alpha'') + \frac{\lambda^3 b}{864}$$

here λ must be expressed in hours and decimals of an hour, and reckoned from Washington or from 180° from Washington according as the upper or lower culmination is used for the middle value (F_0). Adding twelve hours to the Washington time of lower transit at Washington gives the local time of upper transit at places whose longitude is 180° from Washington.

The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within $1''$ of the opposite limb, both can be well observed, and in such cases both are indicated, the defective limb being indicated by an italic letter or numeral, and the correction for defective illumination (as seen from Washington) being given in footnote.

Pages 538–555 contain for each of the seven major planets, the geocentric *apparent Right Ascension* and *Declination*, the *Horizontal Parallax*, *Semidiameter*, *Sidereal Time of Semidiameter Passing Meridian*, and the *Washington Mean Time*, for the moments of all transits which it is usually desirable to observe over the meridian of Washington. The stellar magnitude at opposition for Mars, Jupiter, Saturn, Uranus, and Neptune, respectively, is given at the bottom of the page containing the ephemeris of the planet.

PART III.—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Greenwich mean time, except in the case of the occultations visible at Washington, where Washington time is used.

Pages 558–565 contain all necessary data respecting the solar and lunar eclipses which occur during the year.

The eclipse elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse remain the same throughout all parts of the Earth, and require no explanation.

beyond a mere statement of the fact that in computing them the geometrical diameter of the Earth's shadow has been augmented in the proportion of 51 : 50. The principal circumstances of each total and annular eclipse of the Sun are stated in five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse at local apparent noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane, together with the latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface.

The lines entitled "Central eclipse ends" and "Eclipse ends" give, respectively, the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at local apparent noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outline of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of 1918, June 8, begins and ends at Denver, Colo., latitude $+39^{\circ} 41'$, longitude $+104^{\circ} 57'$.

For the beginning we compare the distance of the place from the curve of 10^h with the distance between the curves of 9^h and 10^h and find it to correspond to about 10 minutes, thus giving for the approximate time of beginning $10^h 10^m$; for the end we compare the distance of the place from the curve of 12^h with the distance between the curves of 11^h and 12^h and find it to correspond to

about 30 minutes, thus giving for the approximate time of ending 12^h 30^m; and both of these results are probably correct to within 3 or 4 minutes.

Changing to local mean time, we shall have—

	<i>Beginning.</i>			<i>Ending.</i>		
	d	h	m	d	h	m
Greenwich mean time	June	8	10 10	8	12 30	
Longitude west			7 0		7 0	
Local mean time	June	8	3 10	8	5 30	

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relative to the central line and to the limit. On the central line the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit, the measurements being made upon a line drawn through the place perpendicularly to the central line.

More Accurate Computations.—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements which are given for every 10 minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of *xy*. We take the intersection of this plane with that of the Earth's equator as the axis of *x*, and the center of the Earth as the origin of coordinates. The axis of *y* is perpendicular to that of *x*, and directed toward the north; *x* and *y* are then the coordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle *d*, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l_1 and l_2 are the radii of the shadow cones upon the fundamental plane, l_1 corresponding to the penumbra, and l_2 to the umbra. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which l_1 is regarded as positive for an annular and negative for a total eclipse.

The angles f_1 and f_2 , the tangents of which are given, are the angles which the elements of the respective shadow cones make with the axis of the shadow; r , they are the semiangles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of x' , y' , and μ' , which are the changes of *x*, *y*, and μ , in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that the distance of the observer from the axis of the shadow cones is equal to the radius of the penumbra at the point of observation for the beginning and ending of the eclipse, and is equal to the radius of the umbra at the

point of observation for the beginning and ending of totality or of the annular phase. To find this distance and radius in each case we proceed as follows:

(1) The coordinates of the observer, ξ , η , and ζ , together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The coordinates x and y of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find $\rho \cos \varphi'$ and $\rho \sin \varphi'$, which are the geocentric coordinates of the station referred to the Earth's equator, ρ being the distance from the center of the Earth and φ' the geocentric latitude. These coordinates may be computed from the following table based on the compression of the Earth adopted at the Paris Conference of 1911, 1/297, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Coordinates of a Place.

φ	Log F.	Log G.
0°	0.00000	0.00293
5	0.00001	0.00292
10	0.00004	0.00289
15	0.00010	0.00283
20	0.00017	0.00278
25	0.00026	0.00267
30	0.00037	0.00256
35	0.00048	0.00245
40	0.00060	0.00232
45	0.00073	0.00220
50	0.00086	0.00207
55	0.00098	0.00195
60	0.00110	0.00183
65	0.00120	0.00173
70	0.00129	0.00164
75	0.00137	0.00156
80	0.00142	0.00151
85	0.00145	0.00148
90	0.00146	0.00146

For the assumed Greenwich mean time of computation, take from the table of elements the values of $\sin d$, $\cos d$, and μ . Then, with λ for the longitude west from Greenwich, the coordinates of the observer will be—

$$\begin{aligned}\xi &= \rho \cos \varphi' \sin (\mu - \lambda) \\ \eta &= \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2 \\ \zeta &= \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2\end{aligned}$$

and their variations in one minute of mean time will be—

$$\begin{aligned}\xi' &= [7.63992] \rho \cos \varphi' \cos (\mu - \lambda) \\ \eta' &= [7.63992] \rho \cos \varphi' \sin d \sin (\mu - \lambda) - [7.63992] \xi \sin d \\ \zeta' &\text{ is not needed.}\end{aligned}$$

(2) For the same assumed moment of Greenwich mean time, take from the tables of elements the coordinates x and y of the axis of the shadow, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. These variations are represented by x' and y' , and their logarithms are given beneath the tables of x and y .

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N , are computed by the formulæ—

$$\begin{aligned}m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta'\end{aligned}$$

(4) Both for the umbra and for the penumbra, the radius L at the distance ζ from the fundamental plane is computed by the formulæ—

$$L = l - \zeta \tan f$$

l and f being taken from the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ending of the eclipse, we shall have—

$$m = L$$

But, as this condition will rarely be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation—

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values for this angle; the one for which $\cos \psi$ is negative must be taken for the beginning of the eclipse, for the beginning of the annular phase, or for the ending of the total phase, but the one for which $\cos \psi$ is positive must be taken for the ending of the eclipse, for the ending of the annular phase, or for the beginning of the total phase. The correction τ to the assumed time will then be found, in minutes, from—

$$\tau = -\frac{m \cos (M - N)}{n} + \frac{L \cos \psi}{n}$$

However, only in case the value of τ does not exceed a few minutes can the time thus corrected be considered even fairly accurate. Therefore it is best to commence the computation by assuming times near the phenomena wanted. The times for the beginning and the ending of an eclipse may be

derived from the chart with sufficient exactness as previously explained; the time for the total or for the annular phase may then be assumed as midway between the times assumed for the beginning and the ending of the eclipse; or, in case of a partial eclipse, this time midway may be assumed as that of the maximum eclipse.

The more accurate times resulting from the computation as outlined above and as illustrated in the example below may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a value of τ , in each case, which should be very small, and which should give a very accurate time of the phenomenon. Such a repetition of the computation will be advisable, moreover, for the reason that it will enable one to locate and eliminate any accidental numerical errors that may have occurred in the first computation.

As a result of this last approximation the computed times of contact will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction.

Position-angle of Point of Contact.—The position-angle P , of the point of contact, reckoned from the north point of the Sun's limb toward the east, is found by the formula—

$$P = N + \phi$$

where the results of the last approximation are used.

The position-angle V , of the point of contact, reckoned from the vertex of the Sun's limb toward the east, is found by the formula—

$$V = P - C$$

where C is obtained from

$$\tan C = \frac{\xi}{\eta}$$

and again the results of the last approximation are used.

Time of Maximum Eclipse.—For a partial eclipse, or for a central eclipse at a point at which the eclipse is only partial indicated by $\sin \phi$ greater than unity for the umbra, the correction to the assumed time to obtain the time of maximum eclipse is given by the formula—

$$\tau = -\frac{m \cos (M - N)}{n}$$

Magnitude of the Maximum Eclipse.—This is given by the formula—

$$D^* = \frac{L - \Delta}{2L - 0.5446}$$

where $\Delta = \pm m \sin (M - N)$, always taken positive, and L is the radius of the penumbra. D is, in all cases, the ratio to the Sun's diameter of the straight line passing through the centers of the two disks and having for its extremities the Sun's limb that is nearest to the Moon's center and the Moon's limb that is nearest to the Sun's center. In a partial eclipse D is the fraction of the Sun's diameter covered by the Moon.

*Since, in obtaining this formula, the angles of the two shadow cones are considered the same, the value obtained therefrom should be increased by $\frac{1}{16}$ th of itself.

Computation of the Solar Eclipse of 1918, June 8, for Denver, Colo.

The position of Denver is—

Latitude, $\phi = + 39\ 40\ 36$
 Longitude, $\lambda = +104\ 56\ 56$

Its geocentric coordinates are—

$$\rho \sin \phi' = 9.80280$$

$$\rho \cos \phi' = 9.88689$$

From the eclipse chart we find the approximate times of the phases to be—

Beginning June $\begin{matrix} d & h & m \\ 8 & 10 & 10 \end{matrix}$
 Middle $\begin{matrix} 8 & 11 & 20 \end{matrix}$
 Ending $\begin{matrix} 8 & 12 & 30 \end{matrix}$ } Greenwich Mean Time.

June 8	Beginning. 10 ^a 10 ^m	Middle. 11 ^a 20 ^m	Ending. 12 ^a 30 ^m		Beginning.	Middle.	Ending.
	152 48 30	170 18 24	187 48 24	$\log m \sin M$	9.73830 ⁿ	8.43807 ⁿ	9.74607
	104 56 56	104 56 56	104 56 56	$\log \sin \text{ or } \cos M$	9.99527 ⁿ	9.99719 ⁿ	9.99477
	47 51 34	65 21 28	82 51 28	$\log m \cos M$	8.90956	7.49554	8.93962 ⁿ
				$\log \tan M$	0.82874 ⁿ	0.94253 ⁿ	0.80645 ⁿ
$\cos \phi'$	9.88689	9.88689	9.88689	$\log n \sin N$	7.84609	7.89603	7.94699
$\sin (\mu - \lambda)$	9.87011	9.95853	9.99662	$\log \sin \text{ or } \cos N$	9.99567	9.99484	9.99510
	9.75700	9.84542	9.88351	$\log n \cos N$	6.99782 ⁿ	7.08672 ⁿ	7.12613 ⁿ
d	9.96454	9.96453	9.96451	$\log \tan N$	0.84827 ⁿ	0.80931 ⁿ	0.82086 ⁿ
$\sin \phi'$	9.80280	9.80280	9.80280	M	278 26 16	276 30 43	98 52 31
d	9.58899	9.58907	9.58915	N	98 4 18	98 49 4	98 35 24
	9.76734	9.76733	9.76731	$M - N$	180 21 58	177 41 39	0 17 7
	9.39179	9.39187	9.39195	$\log m$	9.74303	8.44088	9.75130
d	9.58899	9.58907	9.58915	$\log n$	7.85042	7.90119	7.95189
$\cos \phi'$	9.88689	9.88689	9.88689	$\log \zeta$	9.85917	9.73454	9.52491
$\sin (\mu - \lambda)$	9.82669	9.62008	9.09459	$\log \tan f$	7.66328	7.66111	7.66328
d	9.96454	9.96453	9.96451	$\log \zeta \tan f$	7.52245	7.39565	7.18819
	9.30257	9.09604	8.57063	l	+0.54220	-0.00358	+0.54240
	9.67812	9.47150	8.94599	$\zeta \tan f$	+0.00333	+0.00249	+0.00154
	+0.58525	+0.58524	+0.58521	L	+0.53887	-0.00607	+0.54086
	-0.20071	-0.12475	-0.03721	$\log m$	9.74303	8.44088	9.75130
	+0.24648	+0.24653	+0.24658	$\log \sin (M - N)$	7.80549 ⁿ	8.60459	7.69714
	+0.47657	+0.29614	+0.08831	$\text{colog } L$	0.26851	2.21681 ⁿ	0.26691
	+0.72305	+0.54267	+0.33489	$\log \sin \phi$	7.81703 ⁿ	9.26228 ⁿ	7.71535
$\cos \phi'$	9.88689	9.88689	9.88689	ϕ	180 22 34	$\begin{cases} -10\ 32\ 26 \\ 190\ 32\ 26 \end{cases}$	$\begin{cases} 0\ 17\ 51 \\ +\ 0\ 17\ 51 \end{cases}$
$\sin (\mu - \lambda)$	9.82669	9.62008	9.09459	$\log m/n$	1.89261	0.53969	1.79941
nst.	7.63992	7.63992	7.63992	$\log \cos (M - N)$	9.99999 ⁿ	9.99965 ⁿ	9.99999
	9.75700	9.84542	9.88351	$\log (1)$	1.89260 ⁿ	0.53934 ⁿ	1.79940
d	9.58899	9.58907	9.58915	$\log L$	9.73149	7.78319 ⁿ	9.73309
	7.35350	7.14689	6.62140	$\log \cos \phi$	9.99999 ⁿ (\pm)	9.99261	9.99999
	6.98591	7.07441	7.11258	$\text{colog } n$	2.14958	2.09881	2.04811
	+0.02408	+0.67310	+1.32200	$\log (2)$	1.88106 ⁿ (\mp)	9.87461	1.78119
	+0.57148	+0.70052	+0.76473	-(1)	+78.090	+3.462	-63.009
	-0.54740	-0.02742	+0.55727	+(2)	-76.043	\mp 0.749	+60.421
	+0.46574	+0.46362	+0.46098	τ	$\begin{matrix} m \\ +\ 2.047 \end{matrix}$	$\begin{matrix} m \\ \{ +2.713 \\ +4.211 \} \end{matrix}$	$\begin{matrix} m \\ -\ 2.588 \end{matrix}$
	+0.38454	+0.46049	+0.54800	T	$\begin{matrix} d & h & m \\ 8 & 10 & 10 \end{matrix}$	$\begin{matrix} d & h & m \\ 8 & 11 & 20 \end{matrix}$	$\begin{matrix} d & h & m \\ 8 & 12 & 30 \end{matrix}$
	+0.08120	+0.00313	-0.08702	$T + \tau$	$\begin{matrix} d & h & m \\ 8 & 10 & 12.047 \end{matrix}$	$\begin{matrix} d & h & m \\ 8 & 11 & 22.713 \\ 8 & 11 & 24.211 \end{matrix}$	$\begin{matrix} d & h & m \\ 8 & 12 & 27.422 \end{matrix}$
	+0.009273	+0.009273	+0.009269				
	+0.002257	+0.001402	+0.000418				
	+0.007016	+0.007871	+0.008851				
	-0.000027	-0.000034	-0.000041				
	+0.000968	+0.001187	+0.001296				
	-0.000995	-0.001221	-0.001337				

Taking the four times just found, a new computation is made in each case. The times resulting from the new computation are—

	Greenwich Mean Time.					Local Mean Time.		
	June	d	h	m	s	h	m	s
Beginning of the eclipse	June	8	10	12	2.7	3	12	15.0
Beginning of total eclipse			11	22	42.7	4	22	55.0
Ending of total eclipse,			11	24	11.4	4	24	23.7
Ending of the eclipse,			12	27	24.2	5	27	36.5

The values from the last approximation of the quantities needed in computing the position angles, and the computation of these position angles, are—

	1st Contact.	2d Contact.	3d Contact.	4th Contact.
log ξ	9.76048	9.84774	9.84899	9.88286
log η	9.58718	9.66626	9.66792	9.73612
log tan C	0.17330	0.18148	0.18107	0.14674
N	98.11	98.82	98.83	98.61
ϕ	180.34	-10.32	190.54	0.27
P	278.45	88.20	289.37	98.88
C	56.14	56.64	56.61	54.50
V	222.3	31.6	232.8	44.4

The magnitude of greatest eclipse is obtained as follows:—

T	11 ^h 20 ^m	l	+0.5423	$L - \Delta$	+0.5387
log ξ	9.7345	$\xi \tan f$	+0.0025	$2L - 0.5446$	+0.5350
log tan f	7.6633	L	+0.5398	D	1.007
log $\xi \tan f$	7.3978	Δ	+0.0011	$1/400 D$	.003
				Magnitude	1.01

Pages 566-570 contain the adopted mean places and annual proper motions of such stars, as bright as magnitude 6.5, as will be occulted during the year by the Moon.

Pages 571-608 contain the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of coordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red'ns from 1918.0* give the quantities necessary to reduce the mean place of the star at the beginning of 1918 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:

The *Greenwich Mean Time* is the moment, T , at which the two bodies are in geocentric conjunction in right ascension. At that moment the coordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle, H*, gives the common geocentric hour-angle of the Moon and star at the same moment, expressed in sidereal time and counted

from the meridian of Greenwich—positive toward the west and negative toward the east. Column Y gives the coordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the variations of x and y in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the time of immersion and emersion of a star relative to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as that already explained for computing eclipses, but somewhat more simple.

Prediction of Occultations for a given Place.—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H-\lambda$, taken without regard to sign, must be less than the semidiurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The Sun must not be much more than an hour above the horizon at the local mean time $T-\lambda$, unless the star is bright enough to be seen in the daytime.

When many occultations are to be selected, the most convenient course will be to write the value of $-\lambda$ on the bottom of a slip of paper, and in passing through the list of occultations to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether $H-\lambda$ or $T-\lambda$ falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

T —the instant of geocentric conjunction of Moon and star in right ascension, expressed in Greenwich mean time;

H —the Greenwich west hour-angle of the two bodies at that moment;

λ —the longitude west of Greenwich;

$h_0 = H - \lambda$ —the local hour-angle of the star at the instant T ;

δ —the star's declination.

The procedure for each occultation will then be as follows:—

(1) The geocentric coordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed by the formulæ and table given in connection with eclipses on page 726.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of geocentric conjunction by the application of an approximate

correction taken from DOWNES's table, printed in the volumes of the American Ephemeris for 1882 to 1899. This correction must be reckoned in mean solar hours, and will be designated by the symbol t . It will have the same sign as h_0 .

When DOWNES's table is not available, the correction may be computed from the formulæ—

$$\begin{aligned}\xi_0 &= \rho \cos \varphi' \sin h_0 \\ \xi' &= [9.4192] \rho \cos \varphi' \cos \frac{4}{3} h_0 \\ t &= \frac{\xi_0}{x' - \xi'}\end{aligned}$$

By applying t to the Greenwich mean time of geocentric conjunction, as given with the elements, we shall have the Greenwich mean time of local conjunction within a few minutes.

(2) Compute for the instant $T+t$ the following quantities, in which t is the sidereal equivalent of the mean time interval t :

$$\begin{aligned}\xi &= \rho \cos \varphi' \sin (h_0 + t_0) \\ \eta &= \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta \cos (h_0 + t_0) - \eta_1 - \eta_2 \\ \xi' &= [9.4192] \rho \cos \varphi' \cos (h_0 + t_0) \\ \eta' &= [9.4192] \rho \cos \varphi' \sin \delta \sin (h_0 + t_0) - [9.4192] \xi \sin \delta \\ x &= x't \\ y &= Y + y't\end{aligned}$$

Compute also m , M , n , N , and ψ from the equations.

$$\begin{aligned}m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta' \\ \sin \psi &= [0.5646] m \sin (M - N)\end{aligned}$$

ψ being taken between the limits $\pm 90^\circ$. Finally compute,

$$\begin{aligned}\tau &= -\frac{[1.7782]m}{n} \cos (M - N) \mp \frac{[1.2135]}{n} \cos \psi \\ \delta\tau &= \frac{[6.7591]\tau^2}{n \cos \psi} [\eta_2 \cos (N \mp \psi) - \xi \sin (N \mp \psi)]\end{aligned}$$

where the double signs are to be taken negative for an immersion and positive for an emersion. Both τ and $\delta\tau$ thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated, respectively, τ' and $\delta\tau'$, while those pertaining to emersion are designated τ'' and $\delta\tau''$. We then have for the Greenwich mean times of the phases,

$$\begin{aligned}\text{Instant of immersion} &= T + t + \tau' + \delta\tau' \\ \text{Instant of emersion} &= T + t + \tau'' + \delta\tau''\end{aligned}$$

These expressions are practically exact, as the corrections $\delta\tau$ seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results it will be advisable to compute ξ , η , x , and y for the times of immersion and emersion finally obtained. If these times are correct, the quantities in question will fulfill the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2725$$

If $\log m \sin (M - N) > 9.4354$, $\sin \psi$ will be numerically greater than unity, and no occultation is to be expected at the given place; but a very brief

one may occur if the excess of the computed distance over the Moon's semi-diameter happens to be within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol P . It is computed from the formulæ—

$$\begin{aligned} P &= N - \psi + \delta P && \text{for immersion,} \\ \text{or } P &= N + \psi + \delta P \pm 180^\circ && \text{for emersion,} \end{aligned}$$

where the angles $N - \psi$ and $N + \psi$ are taken directly from the computation of $\delta\tau$, and δP is found in degrees of arc from the expression,

$$\delta P = \mp \frac{[7.3038]r^2}{\cos \psi} [\eta_2 \sin N + \xi \cos N]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex, V , is also reckoned in the direction from the north toward the east, and is found from the formula

$$V = P - C$$

where C is computed from the expression,

$$\tan C = \frac{\xi + [8.2218]r\xi' - [4.9810]r^2\xi}{\eta + [8.2218]r\eta' + [4.9810]r^2\eta_2}$$

C being taken less or greater than 180° , according as the numerator is positive or negative.

The value of τ employed in the latter formula must be so taken as to correspond with the phase for which C is required.

In the volumes of the American Ephemeris for the years 1882 to 1901 instructions are given for constructing three special tables which greatly diminish the labor of computing occultations, but as these tables should contain from 4700 to 6300 quantities, and as they would apply only to the place for which they were computed, it will rarely be worth while to undertake the labor of forming them. Those who desire further information on the subject may consult any one of the volumes in question.

As an example of an isolated occultation, we will compute that of π Sagittarii on August 18, 1918, for Oxford, Miss., whose position is—

$$\begin{aligned} \varphi &= +34^\circ 22' 12''.6 \\ \lambda &= + 5^h 58^m 7^s.2 \end{aligned}$$

and whose geocentric coordinates are—

$$\begin{aligned} \rho \sin \varphi' &= 9.7492 \\ \rho \cos \varphi' &= 9.9171 \end{aligned}$$

From the elements on page 594 we have,

$$\begin{aligned} T &= \begin{matrix} h & m \\ 16 & 35.4 \end{matrix} \\ H &= + 7 \ 17.3 \\ h_0 &= H - \lambda = + 1 \ 19.2 \end{aligned}$$

and

From the formulæ on page 732, we find the correction, t , to the Greenwich mean time of geocentric conjunction, T , to be about $+0^h 43^m.9$; therefore the Greenwich mean time of apparent conjunction is—

$T+t$ —August 18^d 17^h 19^m.3

π Sagittarii.	Apparent Declination. -21 9.2	G. M. T. of ϕ Aug. 18 16 35.4	Hour Angle. +7 17.3	Y +0.7302	z 0.5768	y +0.1120
h_o	$\begin{smallmatrix} h & m \\ +1 & 19.2 \end{smallmatrix}$	y/t	+0.0820	log m		8.5134
t_o	+0 44.0	Y	+0.7302	log n		9.6223
h_o+t_o	+2 3.2	x	+0.4221	log const.		0.5646
log ($\rho \cos \varphi'$)	9.9171	ξ	+0.4231	log m		8.5134
log sin (h_o+t_o)	9.7093	$x-\xi$	-0.0010	log sin ($M-N$)		9.9743 n
log ξ	9.6264	y	+0.8122	log sin ϕ		9.0523 n
log ($\rho \sin \varphi'$)	9.7492	η	+0.7796	ϕ	- 6° 29'	
log cos δ	9.9697	$y-\eta$	+0.0326	log const.		1.7782
log η_1	9.7189	x'	+0.5768	log m/n		8.8911
log ($\rho \cos \varphi'$)	9.9171	ξ'	+0.1863	log cos ($M-N$)		9.5242
log sin δ	9.5573 n	$x'-\xi'$	+0.3905	log (1)		0.1935
log cos (h_o+t_o)	9.9340	y'	+0.1120	log const.		1.2135
log η_2	9.4084 n	η'	-0.0401	colog n		0.3777
η_1	+0.5235	$y'-\eta'$	+0.1521	log cos ϕ		9.9972
$-\eta_2$	+0.2561	log $m \sin M$	7.0000 n	log (2)		1.5884
log ($\rho \cos \varphi'$)	9.9171	log cos M	9.9998	-(1)	$\begin{smallmatrix} m \\ -1.56 \end{smallmatrix}$	
log cos (h_o+t_o)	9.9340	log $m \cos M$	8.5132	$\mp(2)$	∓ 38.76	
log const.	9.4192	log tan M	8.4868 n	r for immersion	-40.32	
log ξ	9.6264	log $n \sin N$	9.5916	r for emersion	+37.20	
log sin d	9.5573 n	log sin N	9.9693			
log ξ'	9.2703	log $n \cos N$	9.1821			
log η'	8.6029 n	log tan N	0.4095			
log x'	9.7610	M	358 15			
log t	9.8644	N	68 43			
log y'	9.0492	$M-N$	289 32			
log x	9.6254					
log $y't$	8.9136					

The computation of δr for the two contacts is as follows:

	Immersion.	Emersion.		Immersion.	Emersion.
$N \mp \phi$	75° 12'	62° 14'	log [(1)-(2)]	9.6761 n	9.6935 n
log cos ($N \mp \phi$)	9.4073	9.6683	log const.	6.7591	6.7591
log η_2	9.4084 n	9.4084 n	log r^2	3.2110	3.1411
log (1)	8.8157 n	9.0767 n	colog ($n \cos \phi$)	0.3805	0.3805
log sin ($N \mp \phi$)	9.9853	9.9469	log δr	0.0267 n	9.9742 n
log ξ	9.6264	9.6264	$T+t$	$\begin{smallmatrix} d & h & m \\ \text{Aug. 18} & 17 & 19.3 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 17 & 19.3 \end{smallmatrix}$
log (2)	9.6117	9.5733	r	-40.32	+37.20
(1)	-0.0654	-0.1193	δr	-1.06	-0.94
(2)	+0.4090	+0.3744	Greenwich M. T.,	$\begin{smallmatrix} d & h & m \\ \text{Aug. 18} & 16 & 37.9 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 17 & 55.6 \end{smallmatrix}$
(1)-(2)	-0.4744	-0.4937	λ	+5 58.1	+5 58.1
			Oxford M. T.,	$\begin{smallmatrix} d & h & m \\ \text{Aug. 18} & 10 & 39.8 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 11 & 57.5 \end{smallmatrix}$

To find δP and P :

$\log \eta_2$	9.4084 <i>n</i>	$\log \xi$	9.6264	(3)	-0.2386
$\log \sin N$	9.9693	$\log \cos N$	9.5598	(4)	+0.1535
$\log (3)$	9.3777 <i>n</i>	$\log (4)$	9.1862	(3)+(4)	-0.0851
Immersion.		Emerison.		Immersion.	Emerison.
$\log [(3)+(4)]$	8.9299 <i>n</i>	8.9299 <i>n</i>	δP	+ 0.3	- 0.2
$\log \text{const.}$	7.3038 <i>n</i>	7.3038	N	+68.7	+68.7
$\log r^2$	3.2110	3.1411	$\mp \phi$	+ 6.5	- 6.5
$\text{colog } \cos \psi$	0.0028	0.0028	const.	0.0	180.0
$\log \delta P$	9.4475	9.3776 <i>n</i>	P	75.5	242.0

Pages 609–611 contain in detail all the data necessary for observing every culmination of the general list which is visible at Washington during the current year.

Page 612 contains the *Ephemeris for Physical Observations of the Sun*.

Page 613 contains certain elements referring to the Moon, its equator, and its orbit.

i —the inclination of the Moon's mean equator to the Earth's true equator.

Δ —the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic of date.

Ω' —the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator.

Γ' —the longitude of the perigee of the Moon's orbit, referred to the mean equinox of date.

Ω —the longitude of the ascending node of the Moon's orbit on the ecliptic, referred to the mean equinox of date.

ζ —the Moon's mean longitude, referred to the mean equinox of date.

Pages 614–621 contain the *Ephemeris for Physical Observations of the Moon*. The selenographic longitudes are measured in the plane of the Moon's equator, the axis of reference being the radius of the Moon which passes through the mean center of the visible disk positive toward the west—i. e., toward Mare Isidum—and the latitudes are measured from the Moon's equator, positive toward the north—i. e., in the hemisphere containing Mare Serenitatis.

The optical and physical librations in longitude and latitude have been computed with elements and formulæ given on page xi, and their sums are given in the second and third columns, respectively, the physical libration being given separately in the fourth and fifth columns. The Sun's selenographic colongitude (90° —longitude) and latitude and the position-angle of the Moon's axis, C , in the sixth, seventh, and eighth columns, respectively, have been corrected for the effect of physical libration.

When the libration in longitude is positive, the mean center of the disk is displaced toward the east—that is, the region thus exposed to view is on the west limb—and when the libration in latitude is positive the mean center of the disk is displaced toward the south—that is, the region thus exposed to view is on the north limb.

The altitude of the Sun, A , at any given time above the horizon of any point on the Moon whose selenographic longitude and latitude, λ and β , are known, may be computed from the following formula, the Sun's selenographic longitude and latitude being denoted by l_\odot and b_\odot , respectively:

$$\sin A = \sin b_\odot \sin \beta + \cos b_\odot \cos \beta \cos (l_\odot - \lambda)$$

Pages 622–623 contain the data with reference to the illuminated disks of Mercury and Venus. The angle θ is the angle which the arc of the great circle from the planet to the Sun makes with the arc from the planet toward the west.

measured in the direction west, north, east, south. It is measured from 0° to 360° . We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Pages 624–627 contain the *Ephemeris for Physical Observations of Mars*. The quantities here given have been corrected for aberration, so that in using them they should be interpolated to the actual time of observation.

P —the position-angle of the axis of rotation measured eastward from the north point of the disk.

A_\oplus, A_\odot —the planetocentric right ascensions of the Earth and Sun, respectively, measured in the plane of the planet's equator from its vernal equinox.

D_\oplus, D_\odot —the planetocentric declinations of the Earth and Sun, respectively, referred to the planet's equator.

\odot_\odot —the planetocentric longitude of the Sun measured in the plane of the planet's orbit from its vernal equinox.

k —the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i —the angle between the Sun and the Earth as seen from the planet.

g —the angular value of the greatest defect of illumination as seen from the Earth.

Q —the position-angle of the radius of the disk which passes through the point of greatest defect of illumination—that is, of the radius perpendicular to the line joining the cusps. It is measured eastward from the north point of the disk.

The column headed *Central Meridian* contains the longitude of the meridian which bisects the disk, measured from the adopted zero meridian.

The columns headed *Mean Time of Transit of Zero Meridian* contain the Greenwich Mean Time of every transit of the zero meridian across the actual center of the disk.

Page 628 contains, for the *Satellites of Mars*, the diagram of their orbits and the times of their elongations.

Pages 629–632 contain the *Ephemeris for Physical Observations of Jupiter*.

The columns headed *Central Meridian* contain the longitudes of the meridian which bisects the disk, measured from the adopted zero meridian of System I and System II, respectively.

The column headed *Correction for Phase* contains the corrections to be applied to the longitudes of the central meridian to obtain the longitudes of the meridian bisecting the illuminated disk.

The column headed *Transit of Zero Meridian* contains the Greenwich mean time of every fifth transit of the zero meridian across the center of the illuminated disk.

The quantities in the remaining columns on pages 629–630 are the same as those defined under the *Ephemeris for the Physical Observations of Mars*.

Pages 633–659 contain, concerning the *Satellites of Jupiter*, the diagram of the orbits of Satellites I–V, the times of conjunction of Satellites I–IV, the times of elongation of Satellite V, the differences in right ascension and declination between Jupiter and Satellites VI and VII, and the phenomena of the Satellites I–IV together with their configurations.

Page 660 contains the *Magnitude of Saturn* and the *Elements of the Rings*.

a, b —the major axis and minor axis, respectively, of the outer ellipse of the outer ring.

P —the position-angle of the northern semi-minor axis of the rings, measured from the north, positive toward the east.

B—the Saturnicentric latitude of the Earth referred to the plane of the rings, positive toward the north.

U+180°—the Saturnicentric longitude of the Earth measured in the plane of the rings from their ascending node on the Earth's equator.

e—the distance in the plane of the rings from their ascending node on the Earth's equator to their ascending node on the ecliptic.

B'—the Saturnicentric latitude of the Sun referred to the plane of the rings, positive toward the north.

U'+180°—the Saturnicentric longitude of the Sun measured in the plane of the rings from their ascending node on the ecliptic.

Pages 661–669 contain, concerning the *Satellites of Saturn*, the diagram of the orbits of the seven inner satellites, the times of elongation for the first eight satellites, the differences in right ascension and declination between Saturn and Phœbe, the ninth satellite, and tables for predicting the position-angles and distances from the center of the planet of the first eight satellites.

Page 670 contains the diagram of the orbits of the satellites of Uranus, together with the times of their elongations.

Pages 671–672 contain tables for predicting the position-angles and distances from the center of the planet of the satellites of Uranus and Neptune.

Page 673 contains the diagram of the orbit of the satellite of Neptune, together with the times of its elongations.

Pages 674–675 contain the *Phenomena*, or the configurations of the Sun, Moon, and planets, expressed in the symbols of page xviii. The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are, respectively, the instants when the longitude of each planet differs from that of the Sun by 0°, ±90°, or 180°. For the conjunction of the planets with the Moon and with each other, the predicted times are the instants when the two bodies have the same right ascension. In the case of conjunction the degrees and minutes to the right indicate the difference of declination. Thus, $\delta \text{ } \mathfrak{C} \dots \mathfrak{C} - 4^{\circ} 22'$ would be read "Conjunction of Mars with the Moon, Mars 4° 22' to the South."

These pages contain also the beginning of the seasons; the perihelia and aphelia of the planets, including the Earth; the passage of the planets through the nodes of their orbits upon the ecliptic; and the date of lunar and solar eclipses, with their aspect as seen from Washington.

Pages 676–685 contain the *Positions of Observatories*, together with a list of the authorities from which the positions are obtained. The tabular arrangement is self-explanatory.

Page 686 contains two examples in the computation of lunar distances, which are inserted because lunar distance tables are no longer published.

Pages 687–711 contain a series of tables numbered from I to VII.

Table I—For Finding the Latitude by an Observed Altitude of Polaris.

Table II—For converting Sidereal into Mean Solar Time.

Table III—For converting Mean Solar into Sidereal Time.

Table IV—For Finding the Azimuth of Polaris at All Hour Angles.

Table V—For Finding the Azimuth of Polaris at Elongation.

Table VI—For Finding the Times of Upper and Lower Culmination of Polaris.

Table VII—For finding the Apparent Place, Time of Upper Culmination, and Time Interval between Upper Culmination and Elongation, of Polaris.

738 INDEX TO APPARENT PLACES OF STARS, 1918.

Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.
Andromedæ.	Aquarii.	Argus.	Boëtis.	Can. Maj.	Cassio.	Ceti.
α 316	δ^1 507	ψ 395	f 429	ξ^2 372	36 H. 336	θ 326
β 324	c^2 504		11 426	o^2 376	38 327	ι 317
γ 332	i^1 510	Arietis.	33 431		40 327	μ 338
δ 320				Can. Min.	50 332	ν 336
ϵ 320	Aquilæ.	α 332	Bradley.	α 381	55 333	ξ^1 333
ζ 321		β 331		β 380		ξ^2 336
ι 509	α 476	δ 343	1147 385		Centauri.	o 335
κ 510	β 477	ϵ 340	1672 235		α^2 431	π 338
λ 509	γ 475	ζ 344	2777 487	Can. Ven.	β 426	σ 336
μ 323	δ 472	ν 337		α 420	γ 418	τ 329
o 503	ϵ 469	σ 339	Camelop.	2 415	δ 413	υ 331
π 319	ζ 469	τ 344	β 358	8 416	ϵ 424	2 513
σ 317	η 476	41 339	4 356	17 H. 423	ζ 425	12 319
υ 327	θ 478		9 357	20 421	η 431	13 319
ψ 511	κ 474	Aurigæ.	17 362	Capricorni.	θ 427	20 322
22 317	λ 470	α 361	43 374		ι 422	67 334
	μ 473	β 367	2 H. 346	α^2 479	λ 410	Chamæleon.
Antlæ.	τ 478	δ 367	5 H. 348	β 479	π 409	β 415
	ω 472	ϵ 358	9 H. 349	γ 492	n 419	δ^2 404
α 401	1 465	ζ 358	19 H. 360	δ 492		ζ 234
θ 396	2 466	η 359	22 H. 369	ζ 490	Cephei.	θ 387
ι 405	6 467	θ 368	23 H. 372	θ 486	α 489	π 411
		ι 357	25 H. 233	ι 489	β 491	
Apodis.	Aræ.	λ 361	30 H. 234	μ 493	γ 510	Cœli.
α 432	α 455	μ 360	32 H. 235	π 480	ζ 496	α 356
γ 447	β 454	ν 366		ρ 480	η 484	
δ^1 444	δ 455	o 365	Cancrî.	υ 482	θ 481	
θ 425	ϵ^1 451	χ 363	α 391	ψ 483	ι 502	Columbæ.
59 G. 236	θ 461	ψ^1 370	β 386		κ 479	α 365
		ψ^2 374	γ 389	Carinæ.	o 506	o 361
Aquarii.	Argus.	51 372	δ 389	δ^1 391	π 504	
α 494	α 371	63 377	ζ 385		11 492	Comæ.
β 491	β 393		η 388	Cassio.	20 495	20 416
γ 497	γ 385	Boëtis.	ι 389	α 320	24 496	24 417
δ 502	δ 390	α 428	κ 392	β 316	39 H. 238	31 419
ϵ 484	ϵ 386	β 435	σ^2 390	γ 323	41 H. 511	43 421
η 489	η 403	γ 430	ω 383	δ 326	43 H. 232	
θ 497	θ 403	δ 437	d^1 386	ϵ 330	47 H. 341	
ι 495	ι 393	ϵ 432	83 393	ζ 319	48 H. 343	
λ 502	λ 392	η 425		η 322	51 H. 233	Cor. Austr.
μ 485	μ 404	θ 429	Can. Maj.	ι 335	226 B. 499	α 470
ν 487	ν 373	λ 428	α 374	μ 324		Cor. Bor.
ξ 491	ξ 382	μ 437	β 370	o 321	Ceti.	α 439
π 498	π 378	ν^1 439	γ 377	ρ 512	α 341	β 438
σ 498	ρ 384	ρ 430	δ 377	ω 328	β 321	ϵ 443
τ 501	σ 380	σ 431	ϵ 376	4 507	δ 337	ζ 440
υ 499	τ 375	τ 424	ζ 369	5 H ¹ . 505	ζ 330	θ 445
φ 505	υ 396	ψ 435	η 379	21 321	η 324	
ψ 505	φ 398	c 435	θ 376			
ω^2 510	χ 383	d 427				

INDEX TO APPARENT PLACES OF STARS, 1918. 739

No. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.
Arvi.	Doradus.	Eridani.	Groombr.	Horologii.	Leonis.	Lupi.
417	α 355	ν 354	1446 388	α 352	ε 396	β 434
414	δ 366	σ^1 352	1450 387	μ 342	ζ 400	γ 439
416		τ^2 340	1586 397	38 G. 344	η 398	ζ 436
413	Draconis.	τ^3 341	1706 405		θ 408	
		τ^5 347	1830 412	Hydræ.	ι 409	Lyncis.
teris.	α 427	τ^6 348	2001 423		μ 397	
	β 456	ν^5 353	2164 433	α 394	ξ 395	2 369
406	γ 460	φ 334	2283 236	γ 422	σ 396	8 371
407	δ 471	ϵ 345	2320 444	δ 388	π 398	15 375
408	ε 476	g 348	2377 450	ε 390	ρ 402	24 381
411	ζ 453	12 343	2533 463	ζ 390	σ 409	26 383
	η 447	53 355	3241 481	θ 392	τ 409	27 384
ucis.	θ 443		4163 512	λ 399	ν 410	31 386
	ι 438	Fornacis.		μ 401	χ 407	40 393
	κ 417			ν 404	d 406	
415	λ 410	β 339	Gruis.	ξ 410	l 404	Lyræ.
419	ξ 459	κ 335	α 495	π 426	p^4 407	
416	σ 468	μ 334	β 500	σ 388	54 405	α 466
414	τ 472		γ 493			β 467
	χ 464	Geminor.	ε 501	Hydri.	Leo. Min.	γ 469
gni.	ψ 458		ι 504			θ 471
	ω 457	α^2 380		α 332	10 395	ι 470
483	A 448	β 382		β 318	19 398	R 468
473	1 H. 234	γ 372	Herculis.	γ 349	31 401	
480	3 411	δ 378		δ 335	41 403	Mensæ.
475	4 H. 414	ε 373	α 453	ε 337	42 403	δ 353
484	9 H. 402	ζ 376	β 448	θ 342	46 405	ζ 233
488	12 H. 441	η 369	γ 446	ι 345		31 G. 233
474	35 459	θ 375	δ 453	λ 322	Leporis.	
473	36 463	ι 379	ε 452	μ 337	α 363	
472	50 467	κ 381	ζ 450		β 362	Microscop.
486	76 237	λ 378	η 450	Indi.	δ 366	
487	79 494	μ 370	θ 460		ε 359	γ 486
478	220 H ¹ . 485	ν 371	ι 457	α 482	ζ 365	θ^1 489
493		ξ 373	κ 444	β 485	η 367	
489	Equulei.	ρ 380	λ 456	ε 494	μ 360	Monocer.
488		φ 382	μ 458	ρ 502		
490	α 488	χ 384	ξ 460			
475		1 368	σ 462	Lacertæ.	Libræ.	
481	Eridani.	51 377	π 454			8 373
487			σ 449	α 498	α 433	8 370
491	α 328	Groombr.	τ 446	3 498	β 437	10 371
	β 359		φ 444	10 499	γ 439	18 374
phini.	γ 350	750 232	ω 447		δ 434	25 381
	δ 347	848 355	d 452	Leonis.	ι 436	30 387
482	ε 346	944 232	w 454		λ 442	
482	ζ 344	966 363	49 451	α 399	ξ^2 434	Muscæ.
484	η 340	1119 234	89 459	β 412	2 429	
483	θ 341	1308 379	109 464	γ 400	8 433	α 417
481	μ 356	1374 383	110 466	δ 408	32 438	δ 420

740 INDEX TO APPARENT PLACES OF STARS, 1918.

Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.
Normæ.	Orionis.	Persei.	Puppis.	Scorpii.	Telescopii.	Urs. Min.
γ^2 445	π^5 357	ρ 342	1 G. 368	τ 449	α 464	α 232
	τ 361	τ 340	4 382	24 449		β 433
Octantis.	φ^1 364	ν 328	20 385		Trianguli.	γ 437
α 486	11 359	φ 329		Sculptoris.	α 330	δ 237
β 238	Pavonis.	c 351	Pyxidis.	α 323	β 333	ϵ 236
γ^1 238		m 354	α 389	β 508	γ 334	ζ 441
δ 236	α 480	6 333	θ 394	γ 506		η 447
ζ 234	β 483			δ 511		λ 237
η 235	γ 490	Phœnicis.	Reticuli.	ϵ 330	Tri. Austr.	4 428
ι 235	ϵ 477	α 318	α 352		α 450	5 430
κ 235	ζ 465	β 324	δ 350	Serpentis.	β 442	19 445
λ 238	η 457	γ 326		α 440	γ 436	Velorum.
ρ 236	λ 467	ϵ 316	Sagittæ.	β 440		η 399
σ 237	Pegasi.	μ 320	β 474	γ 442	Tucanæ.	
ν 238		ψ 331	γ 477	ϵ 441	α 497	Virginis.
χ 237	α 503	Piazz.	δ 476	η 463	γ 506	α 422
4 G. 232	β 503	221 434	Sagittarii.	θ 468	ϵ 513	β 412
7 G. 233	γ 317		γ 461	κ 440	ζ 318	γ 418
Ophiuchi.	ϵ 492	Pictoris.	δ 463	μ 441	κ 325	δ 420
α 456	ζ 500	α 375	ϵ 464	ξ 457		ϵ 421
β 458	η 500		ζ 469	τ^1 438	Urs. Maj.	ζ 423
γ 459	θ 496	Pisc. Austr.	η 462	c 465	α 406	η 415
δ 445	ι 495	α 503	ι 477	3 436	β 406	θ 421
ϵ 446	λ 501	ϵ 500	λ 465	Sextantis.	γ 412	ι 428
ζ 449	μ 501	3 488	μ 462	6 397	δ 414	κ 427
η 452	π 496		π 470	33 402	ϵ 420	λ 429
θ 454	τ 507	Piscium.	σ 468	Tauri.	ζ^1 422	μ 432
θ 454	ν 507	γ 506	φ 466	α 354	η 424	ν 413
κ 451	φ 511	δ 322	ψ 471	β 362	θ 395	ρ 418
λ 448	1 490	ϵ 323	c 478	γ 353	ι 391	τ 428
ν 460	16 493	ζ 325	d 471	δ 353	κ 391	φ 430
σ 455	20 494	η 327	f 475	ϵ 354	λ 400	χ 418
b 455	31 497	θ 508	h 473	ζ 364	μ 400	m 424
30 452	55 504	ι 509	54 474	η 348	ν 408	70 423
67 461	59 505	κ 508	Scorpii.	ι 358	σ 387	89 425
70 461	70 508	ν 329	α 448	λ 350	σ^2 392	109 429
72 462	72 509	ξ 331	β 443	μ 352	ψ 407	Volantis.
Orionis.	Persei.	o 329	γ 435	ν 351	χ 411	γ^2 378
α 367	α 345	π 328	δ 443	ξ 346	d 394	δ 379
β 360	β 343	τ 325	ϵ 451	o 345	h 394	
γ 362	γ 342	ν 326	η 453	τ 355	3 H. 384	
δ 363	δ 347	ω 512	ι 458	Δ 351	30 H. 401	
ϵ 364	ϵ 349	f 325	λ 456	f 346	32 399	Vulpeculæ.
ζ 365	ζ 349	30 513	π 442	i 357	36 402	24 479
ι 364	η 339	33 316	σ 446	p 351	76 419	32 485
κ 366	θ 338	44 318				
ν 368	ν 347					
π^5 356	ξ 350					

GENERAL INDEX.

	Page.
Abbreviations	xviii
Aberration, Constant of	xvi
of the Sun	3
Alchernar (Alpha Eridani), Apparent Place	328
Mean Place	217
Age of the Moon	118
Alcyone (Eta Tauri), Apparent Place	348
Mean Place	219
Aldebaran (Alpha Tauri), Apparent Place	354
Mean Place	219
Algol (Beta Persei), Apparent Place	343
Mean Place	218
Alloth (Epsilon Ursæ Majoris), Apparent Place	420
Mean Place	224
Alkaid (Eta Ursæ Majoris), Apparent Place	424
Mean Place	224
Alpha Canis Majoris (Sirius), Apparent Place	374
Mean Place	221
Orbit Position	x
Parallax	ix
Alpha Canis Minoris (Procyon), Apparent Place	381
Mean Place	221
Orbit Position	x
Parallax	ix
Alpha Centauri, Apparent Place	431
Mean Place	225
Orbit Position	x
Parallax	ix
Alpha Ursæ Minoris (Polaris), Apparent Place	232, 711
Mean Place	231
Polaris Tables	687
Alpheratz (Alpha Andromedæ), Apparent Place	316
Mean Place	217
Altair (Alpha Aquilæ), Apparent Place	476
Mean Place	228
Parallax	ix
Anniversaries and Festivals	xiv
Antares (Alpha Scorpii), Apparent Place	448
Mean Place	226
Aphelia of Planets	674
Apogee of Moon	117
Apparent Place of 2 Aquilæ, Example of Reduction to	720
Places of 790 Standard Stars	316
of 35 Circumpolar Stars	232
of 825 Stars, Index to	738
Arcturus (Alpha Boötis), Apparent Place	428
Mean Place	224
Ariel, First Satellite of Uranus	670, 671, 672,

	Page
Arrangement and Use of the American Ephemeris	713
Aspects of the Planets	674
Astronomical Constants	xvi
Azimuth of Polaris at all Hour Angles, Table IV	698
at Elongation, Table V	704
Beginning of the Seasons	674
Bellatrix (Gamma Orionis), Apparent Place	362
Mean Place	220
Besselian Elements of Solar Eclipses	560, 562
Formulae for Star Reductions	200
Star Numbers	202, 214
Example of Reduction with	720
Exclusive of short-period Terms	214
Betelgeux (Alpha Orionis), Apparent Place	367
Mean Place	220
Brilliancy of the Planets, greatest (see Stellar Magnitude under each planet).	
Canopus (Alpha Argus), Apparent Place	371
Mean Place	220
Capella (Alpha Aurigæ), Apparent Place	361
Mean Place	220
Castor (Alpha Geminorum), Apparent Place	380
Mean Place	221
Charts of Solar Eclipses	following pages 560, 562
Chronological Eras and Cycles	xv
Circumpolar Stars, Apparent Places	232
Mean Places	231
Conjunctions of Planets	674
of Satellites	634
Constants, Astronomical	xvi
Culminations, Moon	522
of Polaris, Table VI for finding times of	710
Upper Culmination, Meridian of Greenwich, Table VII	711
Cygni 61, Apparent Place	487
Mean Place	229
Parallax	ix
Day, Civil and Astronomical	714
Length of	xvi
of Julian Period	xv
Deimos, Second Satellite of Mars	628
Delta Cassiopeiæ, Apparent Place	326
Mean Place	217
Used for finding time of culmination of Polaris (Table VI)	710
Deneb (Alpha Cygni), Apparent Place	483
Mean Place	228
Denebola (Beta Leonis), Apparent Place	412
Mean Place	223
Dione, Fourth Satellite of Saturn	661, 664, 666, 668
Disk of Mercury	622
of Venus	623
Distance, Astronomical Unit of	xvi
of the Moon	xvi
of the Planets (see also reference under each planet)	xvii
of the Sun	xvi, 3
Dominical Letter	xv
Earth, Dimensions of	xvi
Elements of Orbit of	xvii
Earth's Radius Vector. Logarithm of	3

	Page.
Date of	xiv.
icities of the Orbits of the Earth and Planets	xvii
s, Solar and Lunar, Elements and Circumstances of	558
Solar, Besselian Elements of	560, 562
Charts of	following pages 560, 562
Correction to Elements of	x
Example of the Computation of	729
Local Circumstances of	564
, Obliquity of	3
1 Day, Date of	xiv
ts of Planetary Orbits	xvii
ions of Planets	674
of Satellites	628, 634, 662, 670, 673
ion, Azimuth of Polaris at, Table V	704
of Polaris, Time Interval from Upper Culmination, Table VII	711
lus, Second Satellite of Saturn	661, 663, 666, 668
.	xv
ris for the Meridian of Greenwich (Part I)	1-198
of Washington (Part II)	199-555
n of time for Greenwich Mean Noon	2
for Washington Apparent Noon	514
r, Moon's	613
kes, Date of	674
.	vi
le of the Computation of Lunar Distances	686
of Occultations	733
of Solar Eclipses	729
Reduction of Stars to Apparent Place	720
of the Sun	716
ls, etc	xiv
aut (Alpha Piscis Australis), Apparent Place	503
an Place	230
tric Ephemerides of the Planets	134
Latitude of Observatories, Reduction to	676
number	xv
, Acceleration due to	xvi
Gaussian Constant of	xvi
ich Ephemeris (Part I)	1-198
l's Spheroid	xvi
ntric Coordinates of the Planets	142
on, Seventh Satellite of Saturn	661, 664, 667, 669
, Eighth Satellite of Saturn	661, 664, 667, 669
ndent Star-Numbers	206, 214
Example of Reduction with	721
Exclusive of short-period Terms	214
Formulae for	200
ion	xi
Period	xv
Diameter, Apparent Equatorial	630
Distance from Earth, logarithm of	174
Elements of Orbit of	xvii
Ephemeris for Physical Observations of	629
Elements used	xii
Greenwich, Transit of	174
Heliocentric Longitude and Latitude of	182
Horizontal Parallax of	174, 548
Occultation of	593
Radius Vector (Distance from Sun), logarithm of	183

	Page.
Jupiter, Reduction to Orbit	182
Right Ascension and Declination at Greenwich Mean Noon	174
at Washington Transit	548
Satellites, Diagram of Apparent Orbits of	633
Synodic Periods of	633
I, II, III, and IV, Phenomena and Configurations of	638
Times of Superior Conjunction of	634
Satellite V, Greatest Elongation of	634
Satellites VI and VII, Differential Coordinates of	636
Semidiameter, Adopted Constant of	xvii
Polar	174, 548
Sidereal Time of, Passing Meridian	548
Stellar Magnitude of	548, 629
Washington Transit of	548
Latitude, for finding, by an Observed Altitude of Polaris, Tables I, Ia	687
Formula for Reduction to Geocentric	xvi
Heliocentric, of the Planets	142
of the Moon	118
Corrections to	x
of the Sun	3
Length of the Day	xvi
of the Month	xvi
of the Seconds Pendulum	xvi
of the Year	xvi
Libration of the Moon	614
Light, Velocity of	xvi
Longitude, Heliocentric, of the Planets	142
Mean, of the Moon	613
Nutation in	3
of the Sun	3
of the Moon, Corrections to	x
Precession in	3
Short Period Terms of Nutation in	215
True, of the Moon	118
Lunar Distances, Examples in	686
Magnitudes, Stellar, of Jupiter	548, 629
of Mars	546, 624
of Mercury	622
of Neptune	554
of Saturn	550, 660
of Uranus	552
of Venus	623
Maps of Solar Eclipses	following pages 560, 562
Markab (Alpha Pegasi), Apparent Place	503
Mean Place	230
Mars, Distance from Earth, logarithm of	162
Elements of Orbit of	xvii
Ephemeris for Physical Observations of	624
Elements used	xii
Greenwich Transit of	162
Heliocentric Longitude and Latitude of	170
Horizontal Parallax of	162, 546
Occultation of	599
Radius Vector (Distance from Sun), logarithm of	170
Reduction to Orbit	170
Right Ascension and Declination at Greenwich Mean Noon	162
at Washington Transit	546
Satellites of	633

	Page.
ars, Semidiameter, Adopted Constant of	xvii
Apparent	162, 546
Sidereal Time of, Passing Meridian	546
Stellar Magnitude of	546, 624
Washington Transit of	546
ass of Planets	xvii
ean Places of 790 Standard Stars	217
of 35 Circumpolars	231
of Stars Occulted by the Moon	566
ean Solar into Sidereal Time, Table III	695
ercury, Apparent Disk of	622
Distance from Earth, logarithm of	134
Elements of Orbit of	xvii
Greenwich Transit of	134
Heliocentric Longitude and Latitude of	142
Horizontal Parallax of	134, 538
Radius Vector (Distance from Sun), logarithm of	142
Reduction to Orbit	142
Right Ascension and Declination at Greenwich Mean Noon	134
at Washington Transit	538
Semidiameter, Adopted Constant of	xvii
Apparent	134, 538
Sidereal Time of, Passing Meridian	538
Stellar Magnitude of	622
Washington Transit of	538
eridian Passage of Jupiter	174, 548
of Mars	162, 546
of Mercury	134, 538
of Moon	118, 522
of Neptune	196, 554
of Saturn	184, 550
of Sun	514
of Uranus	193, 552
of Venus	150, 542
imas, First Satellite of Saturn	661, 662, 666, 668
ira (Omicron Ceti), Apparent Place	335
Mean Place	218
izar (Zeta Ursæ Majoris), Apparent Place	422
Mean Place	224
Used for finding time of Culmination of Polaris (Table VI)	710
onth, Length of	xvi
oon, Age of, Greenwich Mean Noon and Midnight	118
Apogee and Perigee	117
Bright Limbs	522
Corrections to the Long., Lat., and Hor. Parallax of the	x
Culminations, upper and lower, Meridian of Washington	522
Distance from Earth, Mean	xvi
Eclipses of, Elements and Circumstances	558
Ephemeris for Physical Observations of	614
Formula used	xi
Hourly	26
Equator, Position of	613
Libration, Formulæ for computing	xii
Longitude and Latitude of	118
Formulæ for	vii
Longitude, Mean	613
True	118
Motion of, in Mean Longitude	60

	Page
Moon, Node, Mean Longitude of	613
Parallax for Greenwich Noon and Midnight	118
for Washington, upper and lower transit	522
Mean Equatorial Horizontal	xvi
Perigee and Apogee	117
Perigee, Mean Longitude of	613
Phases of	117
Right Ascension and Declination for each Hour	26
for Washington upper and lower Transit	522
Semidiameter, Adopted Constant of	xi, xvii
Apparent	118, 522
Sidereal Time of, Passing Meridian	522
Transit, upper and lower, at Greenwich	118
at Washington	522
Neptune, Distance from Earth, logarithm of	196
Elements of Orbit of	xvii
Greenwich Transit of	196
Heliocentric Longitude and Latitude of	196
Horizontal Parallax of	196, 554
Radius Vector (Distance from Sun), logarithm of	196
Reduction to Orbit	196
Right Ascension and Declination at Greenwich Mean Noon	196
at Washington Transit	554
Satellite, Apparent Apsides of	673
Diagram of Apparent Orbit of	673
Sidereal Period of	673
Tables for Determining Position Angle and Distance of	672
Times of Elongation of	673
Semidiameter, Adopted Constant of	xvii
Apparent	196, 554
Sidereal Time of, Passing Meridian	554
Stellar Magnitude of	554
Washington Transit of	554
Node, Mean Longitude of the Moon's	613
Nutation, Constant of	xvi
Formulæ for	viii
Terms of Short Period in the	215
in Longitude	3
Oberon, Fourth Satellite of Uranus	670, 671, 672
Obliquity of the Ecliptic, True	3
Mean	xvi
Short Period Terms of Nutation in	215
Observatories, Positions of, etc.	676
Occultations, Elements for Prediction of	571
Example of Computation of	733
Mean Places of Stars	566
of Planets	593, 599
Visible at Washington	609
Opposition of Planets	674
Orbits of the Planets, Elements of	xvii
Orbit Positions of Sirius, Procyon, and α^2 Centauri	x
Parallax, Annual of τ Ceti, ϵ Eridani, Sirius, Procyon, α Centauri, Altair, and 61 Cygni	ix
Corrections to, of the Moon	x
Horizontal, of Jupiter	174, 548
of Mars	162, 546
of Mercury	134, 538
of Moon	xvi, 118, 522

	Page.
allax, Horizontal, of Neptune	196, 554
of Saturn	184, 550
of Sun	2
of Uranus	193, 552
of Venus	150, 542
Solar, Constant of	vii, xvi
dulum, Length of Seconds	xvi
idge of the Moon	117
Longitude of Moon's	613
ihelia of Planets	xvii, 674
ses of Eclipses of Jupiter's Satellites	639
of the Moon	117
nomena, Eclipses, Occultations, Satellites, etc., Part III	557
of Jupiter's Satellites	638
Planetary Configurations	674
obos, First Satellite of Mars	628
ebe, Ninth Satellite of Saturn	661, 665
raical Observations of Jupiter, Ephemeris for	629
of Mars, Ephemeris for	624
of the Moon, Ephemeris for	614
of the Sun, Ephemeris for	612
netary Configurations	674
Orbits, Elements of	xvii
nets, Aspects of	674
at Greatest Brilliancy (see Stellar Magnitude under each planet)	
at Stationary Points	674
in Ascending and Descending Node	674
in Conjunction	674
in Elongation	674
in Opposition	674
in Perihelion and Aphelion	674
in Quadrature	674
Occultations of	593, 599
Semidiameters of	xvii
Signs of	xviii
aris (Alpha Ursæ Minoris), Apparent Place	232, 711
Azimuth of, at All Hour Angles, Table IV	698
Azimuth of, at Elongation, Table V	704
for Finding the Times of Upper and Lower Culminations from Observations in Connection with Zeta Ursæ Majoris (Mizar), S. P. and Delta Cassiopeïæ, S. P., Table VI	710
Mean Place	231
Table I, for Determining Latitude by Observations of Polaris	687
Time of Upper Culmination, and Time Interval between Upper Culmination and Elongation, Table VII	711
e Star (see Polaris).	
lux (Beta Geminorum), Apparent Place	382
Mean Place	221
cession, General	xvi
in Longitude	3
cyon (Alpha Canis Minoris), Apparent Place	381
Mean Place	221
Orbit Position	x
Parallax	ix
rdature of Planets	674
lius Vector of the Earth, logarithm of	3
of the Planets, logarithm of	182

